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but the BAKER CEMENT WASH-DOWN WHIRLER FLOAT SHOE is

still your best bet to insure successful cementing

Before the time comes to land and cement casing, it is highly important to know that the guiding, floating and cementing equipment you intend to use will perform these three vital operations . . .

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Only one shoe can be BEST

Mere words will not prove any product to be the BEST of its kind, but when thousands of cementing jobs have been successfully completed, many under conditions where other shoes have failed, the results clearly brand as BEST the Baker Cement Wash-Down Whirler Float Shoe.

This shoe is the logical outcome of many years experience in designing equipment for guiding, floating and cementing casing—proving such equipment satisfactory for the needs of that period—and constantly improving it to meet changing conditions and to provide greater efficiency.

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THREADED CONNECTION FURNISHED TO FIT ANY TYPE CASING. Baker Floating Units can be furnished with threaded connection to fit the specifications of your casing. (Float collars can be furnished with both "female" and "male and female" threaded connections.) Manufacturing precision assures thread uniformity and accuracy.

AMPLE STRENGTH. The seamless steel casing shoe into which the concrete plug and Plastic BALL-TYPE Valve Assembly are securely anchored provides a unit that has STRENGTH to float the longest and heaviest string of casing with an ample factor of SAFETY.

POSITIVE, LEAK-PROOF BACK-PRESSURE VALVE. The buoyant Plastic BALL-TYPE Back-Pressure Valve floats in the cement slurry or rotary mud and instantly forms a leak-proof double seal against a narrow, tough rubber ring (backed by Plastic and concrete) at the slightest reversal of pressure. Here is Valve Efficiency at its best.

AMPLE CIRCULATION AREAS. The correctly designed, streamlined Valve Assembly provides passageways ample for any circulating or cementing operation . . . a fact attested to by actual field performance under the most severe operating conditions.

BAFFLED WHIRLER PORTS. These whirler ports provide the important wash-down whirler action so advantageous in circulating and cementing operations. When the fluid strikes these baffled ports, a downward and then an upward whirling motion results. In running in, this whirling action provides a means of effectively washing away bridges. During cementing, the whirling action, imparted first to the fluid preceding the slurry and then to the slurry itself, properly prepares the hole to receive the cement. It then assures best possible distribution of a uniform body of cement around the shoe and the shoe joint, reducing the hazard of channeling to a minimum. Here is the ultimate in cementing efficiency.

EASY DRILLABILITY. Complete and easy drillability results from the internal construction of Baker-Formula Concrete and Plastic . . . the Plastic BALL-TYPE Valve Assembly being set on end in the concrete plug to present a minimum cross-sectional area to the drilling bit. The concrete and the Plastic are quickly and easily drilled up and circulated out of the hole. For complete details concerning Baker Cement Whirler Equipment, contact the nearest Baker office or field representative; or refer to Pages 227 to 229 of the 1942 Baker (or Composite) Catalog.

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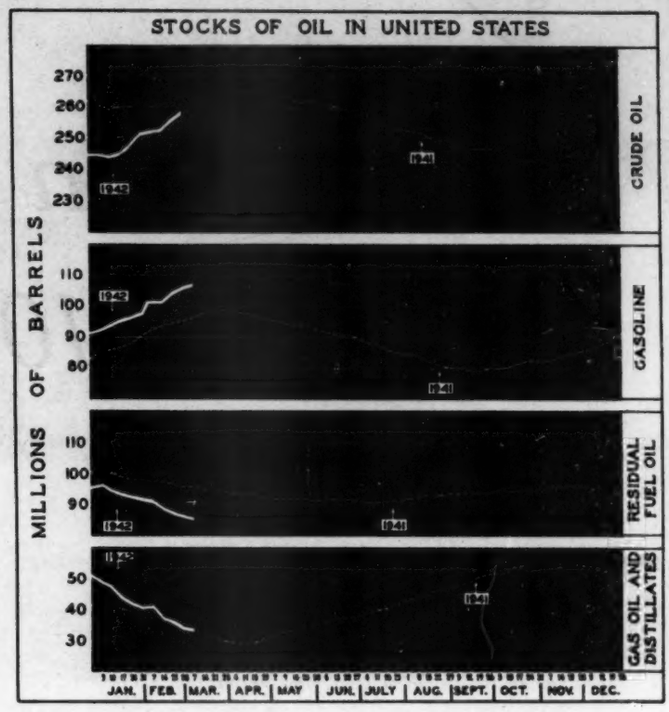
BUY UNITED STATES DEFENSE SAVINGS BONDS AND STAMPS

Trends

Rationing To Bring Important Changes in Operating Practices



THE probable rationing of one or more petroleum products pending a return to normal transportation operations was perhaps the most widely discussed oil development of the past week. There were several other situations of equal or more concern to a substantial number of operators, all of which are a reflection of the application of regulatory powers out of Washington. The head of one of the largest oil companies, who has participated in the plans for petroleum rationing from the time they were first considered last summer, says no problem of the past with which the petroleum industry has been confronted has had as many complications. In his opinion if rationing on a large scale is necessary over a prolonged period, the pooling of refinery output and of all marketing operations is the only practical solution. He explains that wide differences in crude-oil properties, the variations in refining facilities and the fact that the demand for the principal products also varies widely throughout the country, result in a situation in which a uniform curtailment of plant output would not accomplish the objectives sought.

CRUDE PRODUCTION *3,960,200 bbl. daily average—down 55,235 bbl. One year ago 3,635,840 bbl.*

CRUDE STOCKS *259,373,000 bbl. as of February 28 — up 3,512,000 bbl. One year ago 263,176,000 bbl.*

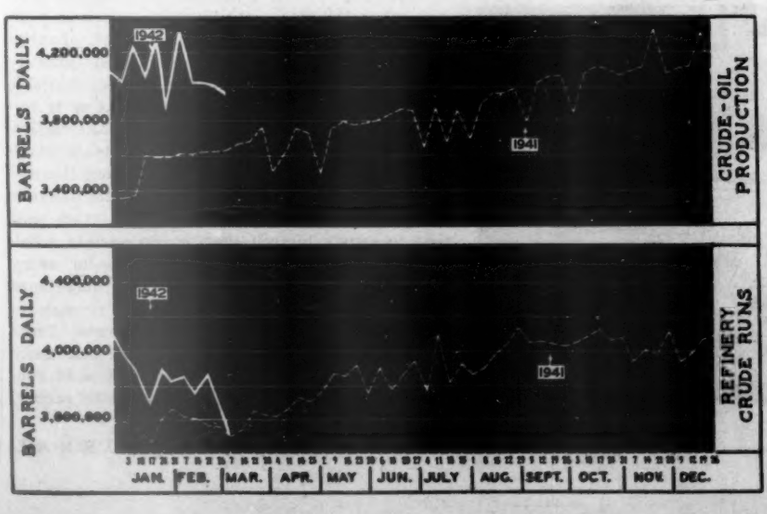
GASOLINE STOCKS *106,668,000 bbl. as of March 7—up 1,033,000 bbl. One year ago 96,075,000 bbl.*

RESIDUAL FUEL-OIL STOCKS *87,531,000 bbl. as of March 7—down 754,000 bbl. One year ago 95,836,000 bbl.*

GAS OIL AND DISTILLATES *33,386,000 bbl. as of March 7—down 1,161,000 bbl. One year ago 33,445,000 bbl.*

REFINERY RUNS *3,530,000 bbl. daily week ended March 7—down 145,000 bbl. One year ago 3,499,000 bbl.*

Others familiar with conditions fear the complications in refinery operations should operators generally be forced to reduce their gasoline yields from crude oil several per cent. This could only be done through a curtailment in cracking operations. This would reduce the quality of gasoline and other products and decrease the output of those cuts and gaseous hydrocarbons which are needed in the 100-octane gasoline and synthetic rubber programs. All who have studied these operating situations emphasize that increased plant costs are inevitable and will have to be offset through the lifting of present price ceilings.



DAILY AVERAGE PRODUCTION FOR WEEK

	Mar. 7, 1942	March OPC recommended production	Feb. 28, 1942
Arkansas	69,850	71,500	73,855
California	622,250	627,000	625,750
Eastern fields	114,500	108,500	112,500
Illinois	334,330	362,500	333,640
Kansas	233,100	245,800	230,000
Louisiana	350,015	314,700	352,100
North Louisiana	*81,565*	.....	*81,500*
Louisiana Gulf Coast	*268,450*	.....	*270,600*
Michigan	48,600	49,500	50,850
Mississippi	84,235	53,100	90,930
Nebraska	3,950	5,100	4,500
New Mexico	120,340	100,200	120,360
Oklahoma	392,000	405,300	393,700
Rocky Mountain states	113,580	107,900	111,800
Texas	1,473,450	1,138,600	1,515,450
East Texas	*368,200*	.....	*368,400*
West Texas	*263,300*	.....	*300,650*
North Central Texas	*149,250*	.....	*148,700*
East Central Texas	*90,900*	.....	*91,400*
Texas Panhandle	*89,750*	.....	*86,700*
Texas Gulf Coast	*418,750*	.....	*423,150*
Southwest Texas	*93,300*	.....	*96,450*
Total United States	3,960,200	3,589,700	4,015,435
Total production, Jan. 1-March 7, 1942		270,683,240 bbl.	
Same period last year		235,144,980 bbl.	

While most operators favor Petroleum Coordinator Ickes' suggestion of confining rationing to those areas where transportation developments have reduced supplies, it is believed that the plan for a nation-wide application as proposed by Price Administrator Henderson, a member of the War Production Board, will eventually prevail. This plan is in line with the OPA program of rationing consumer goods. The price administrator has also emphasized the desirability of reducing gasoline consumption immediately in order to conserve rubber supplies. In this connection scattered reports over the past 2 weeks indicate that restrictions in the sale of new tires is being reflected in reduced gasoline consumption. Many operators contend that these reductions in the use of rubber will shortly bring about all the rationing in gasoline that will be needed.

Half-Million Tons of Metals Needed in 100-Octane Plans

By W. T. ZIEGENHAIN

QUIETLY and effectively the studied program for developing 250,000 bbl. daily of 100-octane aviation-gasoline manufacturing capacity is unfolding among refiners in the United States. The choice of design, financing and the disposition of the produotion from the units are factors which are pretty well outlined by the Washington refining offices of the OPC. But decisions are made only after profound study is completed and after cooperative contacts have been developed among the technical men representing the respective refining companies and engineering companies involved.

When the suggestion was first made to establish 100-octane gasoline as our standard war fuel there was little question but that adequate supplies could be developed to propel the planes, tanks and small boats likely to be needed to defend this country. Then the president suggested a fleet of 50,000 planes and soon thereafter we learned that America was to be designated as the storehouse for democratic nations. That meant supplying the needs of England, Russia and the Dutch.

All Branches Cooperating

At scattered points throughout the nation, alkylation units, isomerization plants, catalytic cracking plants, precision fractionating equipment and auxiliaries are being speedily installed. The refining branch, the natural gasoline, gas and distillate-processing divisions of the industry are cooperating effectively to develop an adequate and sustained supply of the most advantageous charging stock for these units. The survey of hydrocarbons available and the segregation of crude oils early influenced the program.

The wise use of our steel supplies was early foreseen as a factor in designing the plants. Obviously, refiners were in competition with the aircraft industry, the maritime industry and with the Army and Navy men in Washington who were commissioned to provide for military needs first. The lot of the refinery engineering companies for getting steels appeared none too good. However, provisions now seem to have been made for adequate supplies of this metal and especially for April rollings. Wherever there is a chance that a large 100-octane gasoline construction program may be held up for lack of a certain type of steel, that part is likely to be given preference even over direct military needs.

The large and more advanced construction needs are to be filled first and then the construction of additional units is to follow in sufficient volume to keep the supply of 100-octane fuel well ahead of our aviation-motor production program and war needs.

In its entirety, the refiners' program calls for expenditure of at least $400,000,000 and will probably come closer to $500,000,000. It will probably require more than half a million tons of metals. Roughly calculated, each barrel of 100-octane aviation-gasoline manufacturing capacity will call for the installation of 2½ tons of equipment. The great bulk of this demand is for carbon steel, of course, but substantial quantities of heat-resisting and corrosion-resisting steel alloys containing nickel, chromium, tungsten, cobalt, etc., will be needed. Also, large quantities of zinc in the form of galvanized sheets will be consumed. Copper, tin and zinc in the form of electric wires, motor parts, instruments and switches will be required in a combined weight of about 10,000 tons. The instruments and their installation alone will cost approximately $21,000,000.

The exact cost of the program will of course be influenced by new findings as the plan is developed. No two installations are exactly alike because no two refiners have identical conditions under which to add this new equipment. Some refineries will require more of one type of equipment than another to balance with his existing facilities.

100-Octane Program Of Refining Industry

Investment:

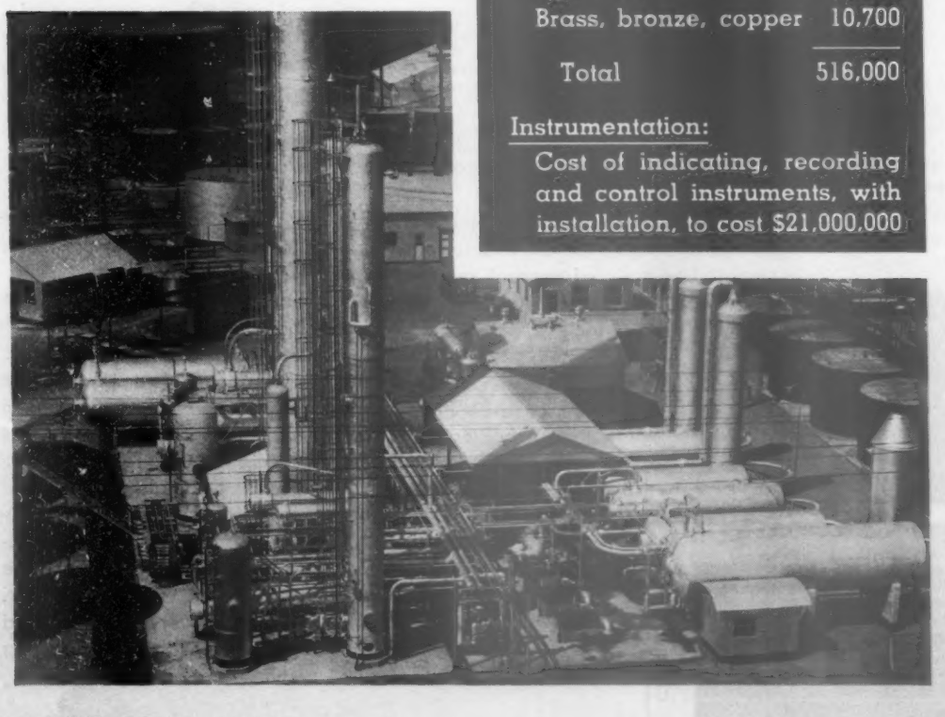
$420,000,000 for new equipment and erection labor

Metals needed (tons):

Carbon steel	392,000
Alloy steels	53,400
Cast iron	59,900
Brass, bronze, copper	10,700
Total	516,000

Instrumentation:

Cost of indicating, recording and control instruments, with installation, to cost $21,000,000



More Isobutane Needed

In the great majority of instances, however, there is need for more isobutane as one of the charging stocks to the alkylation unit which in turn is a very important part of every 100-octane production program.

This need might be visualized if it is understood that 100-octane aviation gasoline is a blend of impure isooctane known as "alkylate," selected straightrun gasoline or catalytically cracked gasoline, tetraethyl lead and isopentane. The latter supplies needed volatility. To a limited extent neohexane is made a part of some 100-octane aviation gasoline.

The "alkylate" is produced by causing the chemical joining of two liquefied fractions of refinery gases, isobutane and butylene. Each is present in ordinary crude oil in very small quantity but each can be recovered in limited quantity from cracked gases. Isobutane is also available as a product of natural-gasoline plants or it can be made by the isomerization of butane to isobutane by dehydrogenation. Butylene is available in reasonably large quantities from thermal cracking operations and it is the problem of every refiner who wants to install an alkylation unit first to satisfy himself that he can sustain a balanced supply of 1.2 bbl. of isobutane for every barrel of butylene available and then make sure that the combined volume is great enough to justify the operation of a commercial unit. Units having a raw-charge capacity of 700 bbl. daily or an output of 300 to 400 bbl. daily are in routine operation. The product, as was stated earlier,

PROPORTIONATE allocation of tanker capacity to all coastwise shippers on a basis of their use of marine transportation during the last half of 1939 and the first half of 1940 given OPC approval. In effect, it is a restricted pooling plan. Participants agree to share all higher costs and maintain membership for 15 months.

●

Price ceiling removed by OPA from aviation gasoline rating 91 octane or higher. Exemption applies to all components used in manufacture of the end products.

●

Special District 1 emergency supply committee recommended a limit on deliveries of gasoline at a level 25 per cent below the corresponding month last year. Plan is essentially a consumer rationing step.

●

Decision on motor-fuel rationing drawing nearer. Leon Henderson, civilian supply administrator, wants curtailment on nation-wide basis. Coordinator Ickes and industry want rationing applied only where shortages exist.

●

Hundred-octane program gaining momentum. Investment of $420,000,000 and steel requirements of 516,000 tons indicated.

●

Reductions of 204,100 bbl. in the production of three states in District 3 recommended by OPC to offset transportation tieup. Texas acted, cut probable March yield 52,723 bbl. daily under the lower OPC suggested average by specifying 4 additional shutdown days.

●

War Production Board refused to grant 456,000 tons of steel for construction of the national-defense pipe line. Proposal to remove idle pipe-line capacity in Texas and relocate it to serve the East Coast receiving more attention.

●

East Coast petroleum stocks reduced 2,599,000 bbl. in last week of February. Oil companies building and leasing more loading racks in Texas and Mid-Continent producing states.

●

Rail shipments of petroleum to East Coast totaled 323,775 bbl. daily during week ended February 28, a reduction of nearly 3,000 bbl. Trend may indicate movement is at peak with present facilities, will be watched for confirmation or refutation.

●

Use of PD-1A in applying for certain types of priority ratings, particularly those of higher classification than assigned by P-98, becomes mandatory March 15.

●

Coordinator Ickes defends use of reserves as one factor in calculating production quotas for various states. Says its his job to see that national oil supply is readily available over war period. Argues withdrawals in proportion to reserves is best assurance. Denies intent of curtailing "stripper" and secondary-recovery production.

●

OPC formed new Division of Supply Tuesday. Placed Robert Lee Minckler, former assistant to the president of General Petroleum Corp., Pacific Coast subsidiary of Socony-Vacuum Oil Co., Inc., in charge. Purpose is to correlate supply adjustments with other branches of industry.

●

District 5 production committee authorized to withhold allowable assignments to Pacific Coast operators violating restrictions in Order M-68.

THIS OBSERVATION TOWER, CROWNED WITH A SEARCHLIGHT, HAS BEEN INSTALLED NEAR A CALIFORNIA TANK FARM AND PRODUCING FIELD AS A DETERRENT TO SABOTAGE

This Week...

is an impure isooctane, which means it has an octane value somewhat below 100 which is designated as the antiknock value of pure isooctane.

A second major blending material may be either a selected straightrun gasoline or a catalytically cracked fraction. This generally is substantially inferior to the alkylate qualities but when blended with isopentane and tetraethyl lead makes a very suitable component of the alkylate blend.

If straightrun gasoline is used it must have a naturally high-octane value and be highly susceptible to lead. If a catalytically cracked fraction is used, it generally costs more to prepare and is less lead-susceptible. However, the latter can be manufactured in relatively large quantities. Catalytically cracked fractions are playing an ever-increasing role in refiners' programs for developing additional capacity to make 100-octane motor fuel. The isopentane that was earlier mentioned is simply a convenient and readily available high-octane material which provides a balanced and desirable volatility. This in turn guarantees quicker starting and surer fire under changing weather conditions. The one factor to avoid is an excess of the material. The latter is important because an aviation fuel can become too volatile at high altitudes and cause vapor lock. The maximum vapor pressure of aviation fuels, fighting grade, is 7 lb. This permits from 5 to 15 per cent of isopentane to be used in the blend, the exact quantity to be determined by the nature of the other constituents. Obviously, under a general program of synthesizing these various hydrocarbons from crude oil and natural gas, the range of the equipment demanded is great. In general, the demands, however, are no different than ordinary modern refining and the plant-retooling job, in order to make this aviation gasoline, is much less drastic than that of the automotive industry in making airplanes and tanks. Also, when the war is over, the new facilities being built in the refineries will fit well into the country's needs as they might be predicted today.

Many authorities believe that this country faces a prolonged period of forced strict economy and this will call for light, low-cost, efficient automobile engines after the war. This means high-compression engines and 100-octane fuel will probably be indispensable. A similar demand for high-octane gasoline will probably come from the aviation industry despite the lack of war pressure, for in the meantime the advantages of 100-octane fuel will be proved beyond a doubt and its economy of manufacture will probably become so well perfected that the use of other fuels in airplane engines will be considered uneconomical.

Phillips Building Two Large 100-Octane Gasoline Plants

The Phillips Petroleum Co. is building two additional large plants for the manufacture of 100-octane gasoline involving the use of its hydrofluoric acid alkylation process according to the company's annual statement issued this week. Its 100-octane program includes additions to facilities for gathering, transporting, and separating raw materials for aviation gasoline and synthetic rubber.

The annual statement also explains that the Hycar Chemical Co. owned jointly by Phillips and the Goodrich Tire & Rubber Co. "is in a position to become one of the largest producers of butadiene and synthetic rubber. Hycar's original plant already has been enlarged to three times its original capacity. A synthetic-rubber plant which Hycar is now building for the Defense Plant Corp. is likewise being tripled in size. Plans also are in preliminary stages for a butadiene plant in conjunction with another synthetic-rubber plant. Except for the original finished rubber plant of the Hycar company, the other projects will be owned by the Government but designed, constructed and operated by Hycar."

Ickes and Henderson Divided On Scope of Oil Rationing

By HENRY D. RALPH

WASHINGTON, D. C., Mar. 9.—A decision on whether or not gasoline should be rationed to consumers is expected to be made here within a couple of weeks.

The subject was discussed publicly last week by the two officials most concerned. Petroleum Coordinator Ickes told a press conference that rationing might be necessary to insure equitable distribution of available supplies but probably would not actually start for some time. Price Administrator Leon Henderson told a Senate committee that it might be necessary to ration gasoline in order to reduce the wear on tires now on privately owned automobiles.

These two officials, therefore, expressed opposite points of view. Secretary Ickes, reflecting the views generally prevailing in the oil industry, took the approach that reduction in automobile use caused by the tire shortage, plus other things which might be done to improve the transporation and stock difficulties in the East, might make consumer rationing unnecessary or only a last resort. Mr. Henderson sees gasoline rationing as an instrument for achieving an immediate and drastic reduction in automobile use to save tires, regardless of conditions in the oil industry.

Since the Office of Price Administration has full power to ration any commodity at the consumer level with or without recommendations from other government agencies, it is quite possible that Mr. Henderson may start a gasoline rationing program in the near future. Needless to say, if the purpose is to reduce tire use the rationing will be drastic and will apply equally throughout the country, even in refining areas where distress gasoline is piling up. In fact, gasoline use might even be restricted almost as much as the purchase of new automobiles and tires, and permitted only for "essential" transportation, on the ground that persons with no right to buy automobiles and tires have no right to wear out those they now own. Mr. Henderson's warning that it might be necessary for the Government to requisition tires now on privately owned vehicles would bear out this possibility.

Secretary Ickes said his decision on gasoline rationing would depend largely on recommendations to be made by industry committees. He expects to receive a report on this subject very shortly.

In his press conference discussion Mr. Ickes said that rationing, if ordered, would be nation wide and not restricted to the East Coast. Later, however, he issued a supplemental statement which said:

"If it is necessary to make recommendations to Mr. Henderson for rationing, the OPC naturally will consider the availability of petroleum products. It will take into account the fact that in refinery areas large stocks of petroleum products may accumulate owing to the unavailability of transportation. Any plan for rationing which we might recommend will recognize this fact."

It should be noted, however, that Mr. Henderson is not required to follow rationing recommendations of the OPC or other agencies.

The general expectation is that the industry will recommend against consumer rationing of gasoline at the present time, and against any rationing in areas where gasoline supplies are plentiful. The general feeling, as reflected by oil men visiting Washington last week, is that measures can be taken to spread available stocks of gasoline in the East so as to make consumer rationing unnecessary, and that the expected voluntary curtailment of automobile use because of the tire shortage may solve the oil transportation problem within a few months.

Among the steps which the oil industry may recommend in lieu of rationing is a nation-wide filling station curfew from 7 p.m. to 7 a.m., and possibly Sunday closing of stations in some areas. Another possibility is a WPB order requiring industrial concerns to convert from fuel oil to coal where they have duplicate facilities or can change without extensive new installations.

Another plan which is receiving serious consideration among companies marketing in the East is a pooling of gasoline and of all marketing facilities in order to eliminate crosshauling, unnecessary storage, excessive filling stations, and produce economies in other ways. This probably would mean elimination of branded gasoline, or at least a uniform specification for all brands, but there appears to be good reason to believe that the industry is preparing to "unitize" its marketing operations in the East.

The Petroleum Industry War Council last week adopted a resolution opposing gasoline rationing in areas where supplies are sufficient, but favoring the night curfew.

The resolution was presented by B. L. Majewski of Chicago, vice president of the Deep Rock Oil Co. and chairman of the council's marketing committee. It was Mr. Majewski who also presented the resolution asking Coordinator Ickes to recommend a WPB order, closing filling stations throughout the United States from 7 p.m. to 7 a.m. daily.

OPC Forms Supply Division

WASHINGTON, D. C., Mar. 10.—The Office of Petroleum Coordinator today created a new Division of Petroleum Supply in charge of Robert Lee Minckler, formerly assistant to the president of the General Petroleum Corp. of California.

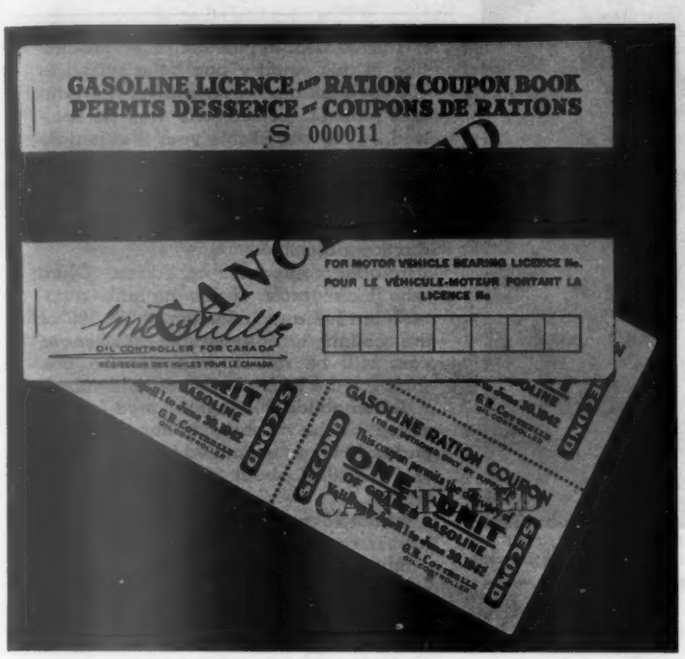
Mr. Minckler is a graduate of the University of Washington and has been with the General Petroleum Corp. since 1924 when he joined the comptroller's department. He later became assistant to A. L. Weil, former president, and more recently has held the same position with S. J. Dickey, present president. He has served as president of the Petroleum Accountants Society of California. Mr. Minckler was engaged in the shipping industry in the Northwest before joining the General Petroleum Corp. and spent considerable time in the Orient.

Robert Lee Minckler of California, appointed Tuesday to head the new OPC Division of Supply

It will be the responsibility of the new division to coordinate action on the many complicated and overlapping petroleum-supply problems in a manner that will assure the availability of the required kinds of products at the right time and the right place, in quantities which so far as possible will meet demands.

Explaining further the functions of the division, Deputy Coordinator Ralph K. Davies said: "Many of the supply problems confronting the oil industry in meeting its war obligations affect more than one functional division of the industry: that is, production, refining, transportation and marketing. Actions taken in one functional division may affect the operations of another. The solution of a problem may be found partly in one division and partly in another. There may be a choice of solutions, one affecting one division, another affecting some other division. To correlate the functional activities so that the proper quantities of the proper kinds and qualities of products are at the proper places at the proper time, the Division of Petroleum Supply has been created.

"This division will be fully informed as to the military and civilian requirements for petroleum products, and the sources and availability of sup-


GASOLINE LICENCE AND RATION COUPON BOOK
PERMIS D'ESSENCE ET COUPONS DE RATIONS
S 000011
FOR MOTOR VEHICLE BEARING LICENCE No.
POUR LE VÉHICULE-MOTEUR PORTANT LA LICENCE No
OIL CONTROLLER FOR CANADA
GASOLINE RATION COUPON
ONE GALLON GASOLINE
SECOND

These sample coupon books will become standard equipment for Canadian motorists April 1 when motor-fuel rationing is applied there. Similar books with each sheet representing one unit of gasoline (probably 5 gal.) may soon apply to motor-fuel sales in this country. Canadian vehicles have been divided into seven classes. Nonessential civilian automobile owners will be granted coupons for 60 units of gasoline for the fiscal year which was originally considered around 300 Imperial gallons. More acute shortages now developing may reduce the unit to around 4 Imperial gallons, making a total of 240 gal. for the year

plies. The division will be responsible for determination of the character and extent of changes in production, transportation, refining and marketing activities which affect quantity, character and location of supplies. The functional divisions will devise and carry into effect the operating plans required to effect such changes.

"There is no uniform pattern of industry organization corresponding to that of the new division. The committee on petroleum economics of the Petroleum Industry War Council and certain special industry committees set up under authority of the petroleum coordinator will be concerned with much the same type of problems."

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COORDINATOR APPROVES TANKER ALLOCATION PLAN DESIGNED TO EQUALIZE EAST COAST DELIVERIES

WASHINGTON, D. C., Mar. 10.—Formal approval of a plan which provides for the equitable allocation of available tanker space for movement of oil to the East Coast was announced today by the office of Petroleum Coordinator Harold L. Ickes.

The plan was developed by the industry transportation committee for District 1, acting on authority of the coordinator, and is designed to mitigate some of the conditions resulting from the disruption of water-borne shipments of petroleum and petroleum products into the area since the outbreak of the war.

When placed in actual operation it will provide the means whereby participants will be assured a percentage of available tanker space in proportion to their use of this transportation method between July 1, 1939, and June 30, 1941.

Subject to certain specified conditions, the "benefits and burdens" of the plan are open to any refiner, marketer or consumer of crude oil or products in District 1 who choose to participate. The conditions are:

1. Each shipper participant must share his proportionate part of the excess cost of transporting oil to the East Coast by alternate means of transportation—by rail, pipe line, barge and tank truck—in accordance with cost-sharing arrangements already authorized by the petroleum coordinator.

2. No participant may withdraw from the plan prior to its termination or prior to the end of the first 15 months of its operation.

Carrier participation in the plan will be at their own election and is limited to owners and operators of tankers in excess of 3,000 registered gross tons.

A tanker managing subcommittee, with headquarters in the RCA Building, New York, and headed by C. H. Kunze of Socony-Vacuum Oil Co., Inc., will administer the program. This committee is now developing the procedure to be followed.

The function of the committee will be that of allocating the carrying capacity of tank ships among shipper participants on a certified percentage basis, and of directing the movements of vessels. Shipper participants will be entitled, however, to retain allocation, control and direction over the movements of any vessel owned or operated by it within the limits of its allotted tonnage.

Synthetic Rubber Plants Given High Preference

WASHINGTON, D. C., Mar. 9.—Priority ratings sufficiently high to assure speedy construction of synthetic-rubber plants to provide 300,000 tons of synthetic rubber in 1943, and 600,000 tons in 1944, have been granted by the War Production Board, it was revealed late last week by Price Administrator Leon Henderson.

Appearing before a special Senate committee charged with investigating the war program, Mr. Henderson revealed that the action was taken at last week's meeting of the WPB. He warned, however, that not a single pound of rubber would be available for recapping or retreading any nonessential civilian tires for the next 3 years, regardless of the synthetic production.

Mr. Henderson told the committee that in spite of the prospect, which he described as a "firm prospect," that the synthetic-rubber program would produce an average of 25,000 tons a month next year, both the United States and United Nations face a shortage of rubber which is vitally needed in the war effort.

It had been expected that Mr. Henderson would sharply attack delays in the formation of the synthetic-rubber-production program, under the supervision of Secretary of Commerce Jesse H. Jones. This attack failed to materialize, after Mr. Jones appeared at the hearing and sat directly facing Mr. Henderson.

In fact, Mr. Henderson warmly praised Mr. Jones' "masterly" efforts to get every available pound of rubber out of Malaya and the Dutch East Indies before they were overrun by the Japanese. However, Mr. Henderson did describe as "extremely optimistic" the estimates of 300,000 tons of the synthetic product in 1943, and 600,000 tons in 1944.

INTRODUCING ANOTHER JOURNAL FEATURE

Engineering Fundamentals

On Pages 51 and 52 of this week's issue, ENGINEERING FUNDAMENTALS, a weekly feature by G. M. Stearns, Associate Professor, Petroleum Engineering, University of Oklahoma, makes its first appearance. As the title implies, each weekly installment will be devoted to showing the application of fundamental principles of engineering to the problems of oil and gas production.

The series is designed to appeal to the man active in field work, who has a high school or nontechnical education but who wishes to better prepare himself to cope with everyday problems and understand more clearly the language of production engineers with which he may be associated. The articles will also be of benefit to engineers who may have lost sight of some of the elementary principles.

Each installment will be complete in itself, with an example of the application of the particular formula to a commonly encountered field problem. The early installments will deal with the more simple phases, but the series will build up to more difficult problems. By having the early installments available, the field production man and engineer will be able to comprehend the later ones.

The installments will not always follow each other in logical sequence, although in many cases the material in one issue will tie in directly with that in succeeding issues. Frequent reference will be made to material presented in previous installments.

A biography of the author appears in Journalisms on Page 96.

Washing the copolymer of butadiene and styrene. Later, the synthetic-rubber particles, like that in the hands of Dr. Waldo Semon, manager of the Goodrich Rubber Co.'s synthetic research division, are placed in forms where they solidify into blocks of latex and are then ready for milling and fabrication

The goal of synthetic-rubber production in this country has been raised to 500,000 tons annually. Half of the original plan of 400,000 tons may be realized by the end of this year if materials are made available for the necessary refinery installations. Expenditures for the whole program will exceed $500,000,000 on the basis of the higher production objective.

Rubber companies in Akron, Ohio, who make most of the nation's automobile tires anticipate that 3,000,000 of the country's nonessential passenger cars will be retired from service this year for the lack of casings and tubes.

Automobiles decommissioned for duration of the rubber shortage by the end of 1943 are estimated from 7,000,000 to 10,000,000, about 33 per cent of the total.

About 75 per cent of the United States rubber consumption normally goes into production of automobile tires.

Oil's Rubber Plantation to Supply Wartime Demand

By H. STANLEY NORMAN

AKRON, Ohio.—The "rubber planation" inherent in the petroleum industry is being tapped with view to freeing this country ultimately from its dependence on natural latex 10,000 to 12,000 miles away across the Pacific.

The program envisaging production of more than 400,000 tons of synthetic rubber by 1944, will pump expenditures of $400,000,000 into the refining branch of the industry. General plans for drawing a large bulk of the chemicals required for such an ambitious program from the petroleum industry sound simple. In reality, however, the task is almost as complex as the chemistry both of the rubber and petroleum industries combined.

The petroleum industry—this term is used in its broader sense to include natural gas and natural gasoline—is expected to supply the butadiene, isobutylene, part of the styrene and probably some of the score of other chemicals that go into production of synthetic latex.

The Government is guarding details of the synthetic-rubber program with zeal, assuming the attitude that more than general disclosures would offer aid and comfort to the enemy. There are certain generalities, however, that indicate the progress of the program and point to certain trends in the manufacturing technique to be employed.

Synthetic-rubber production in the United States will break down into five general classifications, although variations in all types are so numerous that they will not only fill most functions of natural rubber, but open a vast field of possibilities previously served by other materials. Some idea of the versatility of synthetic rubber can be gained from the disclosure by chemists that more than 6,000 polymers have been investigated in association with butadiene. Many chemicals have been found suitable for polymerization with butadiene in the production of rubber-like materials that have an almost inconceivable number of applications, in addition to products previously manufactured from natural latex.

Most of the synthetic-rubber program now projected by the refining industry, rubber companies, and Washington officials is pegged to the use of butadiene derived from petroleum hydrocarbons. Olefin for production of butyl-type rubber, ethylene dichloride, vinyl chloride, styrene, acrylonitrile, and many other chemicals serve a function

COMPARISON OF CHARACTERISTICS

E = Excellent; G = Good; F = Fair; P = Poor

Property—	Rubber	Neoprene	Thiokol	Koroseal	Perbunan	Ameripol O. R.*
Abrasion and tear resistance	E	G	P	E—if heat is not generated	E	E
Adhesion to metals	E	E	F	F	E	E
Aging in storage	E	E	E	E	E	E
Chemical resistance:						
Oxidizing solutions	P	P	P	E	P	P
Ozone	P	E	E	E	F	F
Solutions of salts, alkalies and acids	G	G	G	G	G	G
Color range	E	G	P	E	F	G
Resistance to cutting	G	G	P	E	G	G
Resistance to diffusion of gases	F	G	E	E	G	G
Elasticity and rebound	E	G	P	F	G	F
Electrical properties:						
Conductivity	F	F	F	F	F	F
Resistance to Corona cracking	P	E	E	E	P	P
Dielectric strength	E	F	F	E	F	F
Flame resistance	P	G	P	E	P	P
Resistance to flexcracking	G	G	F	E	G	G
Resistance to flow: Cold	E	G	P	F	E	E
Hot	E	F	P	P	E	E
Hardness range—Durometer A	20-100	10-90	20-80	10-100	10-100	10-100
Low-heat generation through hysteresis	E	F	F	..	F	F
Freedom from odor	G	F	P	E	F	F
Resistance to swelling in:						
Clorinated or aromatic solvents	P	P	G	Shrinks because	P	F
Lacquer solvents	P	P	G	of extraction	P	F
Mineral oil or gasoline	P	G	E	of plasticizer	G to E	E
Water	F	G	.	E	E	E
Resistance to deterioration by mineral oil	P	E	F	G	E	E
Specific gravity of basic material	0.93	1.25	1.35	Ave. plasticizer content 1.30	0.98	1.00
Range of stretchability	E	G	F	F	G	G
Resistance to checking in sunlight	F	E	E	E	F	G
Stability of properties with change of temperature:						
Cold	E	F	E	F	G	G
Heat	G	E	P	P	E	E

*Oil resistant buna type.

in the production of synthetic compounds. Most of these chemicals may be procured from petroleum hydrocarbons.

However, butadiene and butylene are the two petroleum hydrocarbons that will be depended upon for a large bulk of the basic synthetic-rubber production over the next several months. At least a part of the styrene will be produced from the coal tars processed by the chemical industry.

The synthetic-rubber requirements and demand for 100-octane gasoline are conceived by the refining division of OPC at Washington as companion functions of the petroleum industry. Combination units, involving catalytic cracking, dehydration, and close control of pressure and temperature in the final fractionation stages have been designed for the primary purpose of producing maximum quantities of high-octane gasoline components and the basic synthetic-rubber hydrocarbons. These refinery units conceived from the combined skills and knowledge of engineering firms are complex and expensive. Consequently, infinite consideration must be given to available charging stocks, quantity production, and other economic phases for each individual unit.

Availability of materials for construction of the refining plants is, in the final analysis, the governing factor on how rapidly the petroleum industry can attain its production goal of 400,000 tons of synthetic rubber, allowing a reasonable lag for fabrication and erection.

Estimates on Production

Despite the handicap of time consumed in negotiations between refiners, the chemical and rubber industries, and the agencies in Washington, it appears that the oil business will be producing butadiene or butyl types of synthetic latex to the minimum extent of 75,000 to 80,000 tons annually and possibly double that rate, depending upon speed of prosecuting the program, by the end of 1942. Polymerization plants for converting butadiene and styrene into synthetic rubber cost approximately a third of the outlay for equipment with which to recover the hydrocarbons from petroleum sources.

According to an independent calculation, the 1942 productive capacity for synthetic rubber breaks down approximately in this fashion: butadiene-styrene types, 113,000 tons; butyl, 5,000 tons; chloroprene, 19,200 tons; polyvinyl chloride, 18,000 tons. The indicated total of 155,200 tons assumes that plants now under construction and contract will be commissioned during the year.

Dr. E. R. Weidlein, director of the Mellon Institute, Pittsburgh, Pa., and chief consultant to the chemical division of the War Production Board, Washington, holds an even more optimistic view. Dr. Weidlein, who spends 2 days each week in Washington chiefly in consultation on the synthetic-rubber program, believes that the first half of the total plan of 400,000 tons will be in production by the start of 1943. Still other authorities anticipate that the petroleum industry will be producing sufficient butadinene for the production of 70,000 to 90,000 tons of synthetic rubber annually by the end of this year.

Dr. Weidlein's calculations include all types of synthetic rubber. There is no breakdown of his figures available to show what portion of his estimates on productive capacity of 200,000 tons by January 1, 1943, may be provided by the petroleum industry. However, production of chloroprene polysulfide and polyvinyl chloride types will total about 37,200 tons by the end of this year, indicating that about 162,800 tons would be the petroleum industry's contribution.

Butadiene Production

Butadiene, the basic hydrocarbon fraction receiving most consideration in the petroleum industry's end of the synthetic-rubber plans, is present in all low-boiling decomposition or dehydrogenation refinery products in volumes ranging up to 5 per cent. Butadiene is separated from other products by washing with cupric chloride. Dehydrogenation of butane at temperatures of 1,100° to 1,200° F., in the presence of chromium oxide catalyst supported on alumina is another potential source of butadiene that is receiving consideration by the natural gasoline section of OPC at Washington. By this process, 60 to 75 per cent butene may be produced and this in turn may be converted to butadiene to the extent of 60 to 80 per cent by recycling.

However, the potential production of butadiene by dehydrogenation of gases present in vapor-phase, catalytic cracking appears to have an advantage in the over-all refinery program for the immediate future. This conclusion is based on desire of OPC to produce a maximum of 100-octane gasoline and butadiene with a minimum of equipment and expense.

Butyl rubber which has advantages over butadiene types in that raw material is more available in the petroleum industry is the unknown quantity in the synthetic program. Commercial production of this type of synthetic rubber was near fruition when the war opened and, consequently, there is less known about details of manufacture than of the other groups. Essentially, it is a copolymer of olefins with a small amount of diolefins (isobutylene and butadiene). The chief characteristic of butyl rubber is its limited unsaturation, amounting to about 1 or 2 per cent of that present in natural rubber. By varying the olefinic and diolefinic materials in preparation of butyl rubber, it is possible to obtain products that differ materially in properties.

Up to 75 to 80 parts of carbon black may be incorporated in synthetic-butyl rubber before the vulcanizates exceed 60° Shore hardness. This is in the hardness range of natural rubber tire tread containing 50 parts of carbon black.

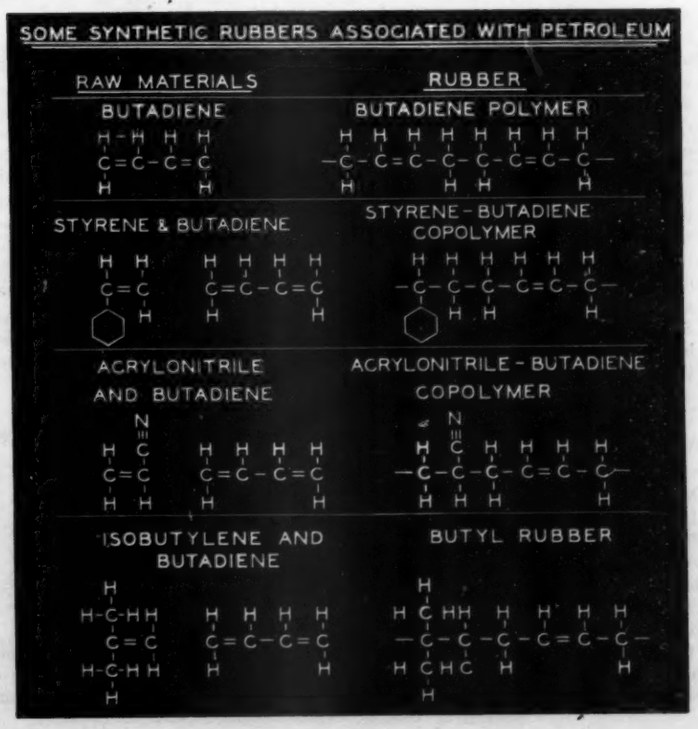
In the earlier stages of synthetic-rubber development, most of the tire manufacturers used buna types chiefly in treads. More recent developments in the research laboratories have proven the synthetic product, in combination with other available stocks, equally satisfactory for construction of tire carcasses. Economy of using the natural material in the earlier stages of synthetic-rubber tire construction was unquestionably a factor in delaying its use in carcasses.

Cost Factors Involved

Cost, in fact, has been one of the most influential factors in delaying the greater production and use of synthetic rubber. Petroleum refiners and rubber chemists are in substantial agreement with governmental agencies that synthetic rubber can be produced from butadiene and styrene at approximately the present price for natural material which is 22.5 cents per pound. Under ideal conditions, the price may be substantially lower. Petroleum refiners are now receiving approximately 18 cents per pound for butadiene. Cost of polymerization and milling along with the price of styrene and other small amounts of chemicals increase the cost to rubber companies to more than natural latex.

Desire of the rubber companies for a stabilizing influence in the latex market has certain implications for the petroleum-refining industry when peace is restored. Refiners have been fearful that creation of a large productive capacity for synthetic rubber might be used chiefly as a whip with which to keep the market for natural latex just under the cost of butadiene-styrene production.

Development of new products from synthetic rubber, improved knowledge of its greater versatility and an increasing appreciation for its superior quality are gradually overcoming the fear of refiners. Furthermore, the Government is pressing vigorously for production of this essential war material and is offering attractive contracts that refiners cannot afford to ignore.



A simplified diagram of some of the chemical reactions between various hydrocarbons and the resulting polymers and copolymers of synthetic rubber. Unsaturates in the polymer make vulcanization possible. Buna-S synthetic rubber, derived from copolymerization of butadiene and styrene, is the most favored type in the government program

VARIETIES OF SYNTHETIC RUBBER

Basic materials—	Trade names
1. Polymers of chloroprene	Neoprene
2. Reaction products of aliphatic dihalides with alkali polysulfides	Thiokols
3. Copolymers of butadiene with styrene, acrylonitrile and other polymerizable compounds	Buna-S Buna-N Perbunan Hycars Ameripols Chemigum
4. Polymers of olefins and diolefins	Butyl
5. Plasticized polymers of vinyl chloride	Koroseal
6. Polymers of isobutylene	Vistanex

STATE CAPITALS...

ILLINOIS

MARKING THE START of a program to open state-owned lands to oil exploration, the Lewis Production Co., of Pittsburgh, Pa., submitted a high bid of $30,000 to the Illinois Petroleum Lease Commission March 4 for the right to survey the 700-acre state game farm near Mount Vernon in Jefferson County.

No award will be made until the commission studies bids submitted by five other firms, state Finance Director George B. McKibbin announced.

Other bids were the Texas Co., $18,422.40; Gulf Oil Corp., $13,500; Sun Oil Co., $12,240; James W. Menhall Co., Benton, Ill., $7,000; and the Wiser Oil Co., Sistersville, W. Va., $5,500.

The permit to be awarded is for exploration rights only, and the successful bidder will be entitled to survey the entire area, later selecting 240 acres on which drilling operations may be conducted. The remainder of the tract eventually will be resubmitted for bids.

Director McKibbin said the commission, created at the last regular session of the legislature, will meet before March 20 to decide on the initial bidding. Other members of the group are Gilbert E. Keebler, state administrative auditor; and Dr. M. M. Leighton, chief of the Illinois Geological Surevy Division of the state Department of Registration and Education.

CALIFORNIA

AN INVESTIGATION of the problem of assigning oil allowables to wells which also produce excessive amounts of water has been requested of the various field committee chairmen by the allocation subcommittee of the Conservation Committee of California Oil Producers. In addition, H. C. Pyle of Union Oil Co., chairman of the allocation committee, will request the production committee for District 5 to consider the problem at its next meeting and take such action as may be proper. This action taken by the allocation committee following a meeting with several affected operators recently was decided upon as the most effective approach to the problem when discussion brought out there appeared to be no general rule or formula that offered a solution. Several members pointed out that steps should be taken to compensate for high water production in assigning allowables. A study of heavy crude-oil production which is under way by the District 5 office of the OPC is nearing completion.

FIELD AND POOL allocation schedules for March compiled by the production committee for District 5 have been submitted to the Office of Petroleum Coordinator, Washington, with the recommendation that they be approved as soon as possible.

In addition, the committee is mailing a copy of the schedules to each operator, for informative purposes. The schedules have not been broken down to the individual wells as yet, but pool schedules will make it possible for the operator to set the production rate for his wells within reasonable limits of the final schedule, so that when it is issued, the operator will have to make but minor adjustments.

The schedule distributes the total state allocation of 627,000 bbl. per day for March, as set by the coordinator, to the various fields.

TEXAS

STATE-WIDE PRORATION hearing will be held at Austin March 16 to receive testimony upon which to base April allowables.

THE RAILROAD COMMISSION heeded suggestions of the OPC last week for a substantial reduction in the allowable production of crude oil during remainder of March to compensate for the blockade of petroleum transportation facilities. Four shutdown days were added to the nine previously provided in the March proration order. Fields exempted from the additional shutdown days are: Lolita, West Ranch, Heyser, New Refugio, Tom O'Connor, Amelia, Cotton Lake, South Cotton Lake, Webster, Hastings, Lovell's Lake, Magnet, Raccoon Bend, Raccoon Bend Cockfield, Turtle Bay, Plymouth, Reynolds, Wade City, Turkey Creek, Orange Grove, O'Hern, Conoco Driscoll, Hoffman, Loma Novia, Rincon and Yates.

The list of exempt fields does not include all those previously designated as producing crude essential to recovery of military products. This may be attributed to a revision in the original list or to considerations other than the grade of crude.

The added shutdown days specified by the commission were March 11, 12, 15 and 18. The 9 shutdown days previously designated were March 1, 7, 8, 14, 21, 22, 25, 30 and 31.

The commission estimated that the additional shutdown days would reduce Texas' allowable to 1,344,963 bbl. daily, averaged over the month. After deducting 52,723 bbl., estimated as the under production averaging 3.9 per cent, the probable daily production for March will be 1,292,240 bbl., or approximately 46,360 bbl. under the OPC's revised certification.

KANSAS

CHARGES WERE DISMISSED at Great Bend last week against two defendants previously charged with violation of the Kansas conservation statutes. The dismissals were on motion of J. G. Somers, Newton, Kans., counsel for the state in the investigation. The "hot oil" investigation was started last summer and resulted in numerous arrests.

Ickes Defends Production Quotas Based on Reserves

OKLAHOMA CITY, Okla., Mar. 7.—Subordination of market demand as a yardstick for establishing oil production rates in the various states was defended in a letter received this week by the Oklahoma Corporation Commission from Petroleum Coordinator Ickes. The message reasserted that OPC has no intention of interfering with the distribution of allowables within the states. However, the coordinator assumed full responsibility of maintaining an adequate national sustained supply of petroleum for all military and essential industrial and civilian requirements. He declared that this obligation required that withdrawals be made on a basis that would prevent any possible failure on the part of the oil industry and the federal agencies.

The table used by Coordinator Ickes to illustrate his contention that reserves should be a factor in rates of crude withdrawal is shown below:

	Per cent of proved reserves in United States as of Jan. 1, 1941	Per cent of United States 1941 production	Per cent of state's own proved reserves produced in 1941
Illinois	1.7	9.2	40.8
Oklahoma	5.3	11.0	15.3
Kansas	3.6	5.9	11.9
Arkansas	1.6	2.3	10.6
Wyoming	1.6	2.2	9.9
Louisiana	6.4	8.3	9.5
California	17.3	16.5	7.0
New Mexico	3.6	2.8	5.6
Texas	55.8	35.7	4.7

Criticism of at least one point in the communication to the Corporation Commission came from many operators who examined its content. In a table showing the percentage of reserves as of January 1, 1941, produced during that year, the coordinator showed that Illinois withdrew 40.8 per cent of its proved underground supply last year. Practical analysts were quick to point out that either the reserve figure used in the calculation was absurdly low or the coordinator had been poorly advised. The production of more than 40 per cent of an area's proved reserves was declared to be a physical impossibility.

"It is of interest to note," he wrote, "that Arkansas, Illinois and Wyoming began the year with almost equal reserves, but that Illinois produced 40.8 per cent of its known reserves in 1941, while Arkansas and Wyoming each produced about 10 per cent of their respective reserves. Kansas and New Mexico began the year with virtually identical reserves, yet Kansas produced 11.9 per cent of its reserves as compared with New Mexico's 5.6 per cent. Oklahoma, having slightly smaller reserves than Louisiana, produced 15.3 per cent of its reserves as against Louisiana's 9.5 per cent. Such widespread and large disparities in the rates at which the various states are drawing upon their petroleum resources to supply the national requirements are definitely inconsistent with the matter of providing efficient over-all operation of the production branch of the industry."

The coordinator's letter, which was written in reply to a communication from the Corporation Commission asking for an explanation of OPC's certified quotas, said that "stripper" and secondary-recovery production should not be limited, except in unusual circumstances.

The OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

Published weekly by The Petroleum Publishing Company at Tulsa, Oklahoma

Protecting the Future

A great deal is being said in Washington on what will be expected of the petroleum industry the final three-quarters of this year, next year and later. Actually, no one at the nation's capital (or elsewhere) knows how much crude-oil production will be required the last half of this year or what the refinery runs to stills will be 6 months or a year from now.

The sooner governmental agencies, and those who advise them, quit worrying about the future until they have some basis to project oil needs and devote their time to the solution of the numerous problems at hand, the better it will be for every one concerned.

At the San Francisco A.P.I. meeting in November, the industry was told to look forward to a 5-million barrel demand before the end of this year. Many were confident that December 7th meant this record demand would start the first of the new year. Then came rubber rationing; shortages of many essential materials; the arrival of enemies at our shores; tanker sinkings and a transportation upset. All this has brought reduced, not expanded, markets.

As to the future, only those who know what will happen over the remainder of the year on all the war fronts which include the coast lines of this country, can state how much oil will be needed in May, next September and during 1943. These prophets, to be entirely accurate, should also be able to unravel a confused Washington which is hardly more than started in many of the military and civilian phases of its war effort.

There could be a series of war developments which would result in increased petroleum demands from several sources. Other possible events would necessitate further contraction for a time.

In the meanwhile, there are plenty of problems already here or just around the corner. If they are handled properly, the petroleum industry will be able to take care of the petroleum requirements of the United Nations, come what will. Indifference as to what is going on now will cripple the industry for the duration.

Currently the industry's major difficulties spring from the reduction in tanker transportation. War secrecy shrouds the actual situation there. However, it should not be necessary for tanks to overflow and pipe lines to prorate their purchases before the industry is told that it has lost part of its normal market.

Then there is the rationing of petroleum. This is an extremely complicated problem to which all the answers cannot be found quickly. But many of the pitfalls can be avoided by advising operators what to expect and how they can best adjust their operations.

For example, if rationing is to be confined to gasoline, refiners need advice in changing their operations to decrease gasoline yields. For 40 years refiners have been devising means to expand the gasoline output from a barrel of crude oil. High-temperature and high-pressure cracking has been supplemented by the new tool of catalysis, not only to increase gasoline yields but also to improve the properties of products. Reversing this trend will revise the whole scheme of refinery processing and this cannot be accomplished overnight.

Producers and suppliers need definite information as to what to expect over the immediate future in regard to drilling and field operations. Important operating schedules and personnel plans are marking time.

Prices need consideration. Many oil operations are carried on with small financial reserves. Losses mean shutdowns. Even the strongest companies can not long absorb the recent advances in transportation costs.

There are literally hundreds of ramifications of these and other developments of the war awaiting advice and action. The protection of petroleum's future lies in the prompt solution of these current problems.

New Preference Forms Mandatory Next Week

CONVERSION to the use of priority forms PD-1A and PD-3A in place of forms PD-1, PD-3, PD-4 and PD-5 becomes mandatory on March 15. Use of the two new forms, specified in Priorities Regulation 3, has been permitted since February 2, but next week the old forms become obsolete and will not be honored after that date by the Division of Industry Operations, War Production Board.

The oil industry is chiefly concerned with PD-1A because the PD-3A is the form for individual applications for priority assistance on which ratings are assigned for Army, Navy and other government officials.

PD-1A, so far as the oil industry is concerned, becomes an emergency priority form to cover materials not procurable under other orders and forms.

The outstanding feature of the two new priority forms is that preferential assistance extended to the consumer for procurement of materials may be extended back through the suppliers and subsuppliers. This provision establishes a line of communication between the producer of raw materials and the consumers of finished products that has been lacking under previous regulations. Previously, manufacturers could not replace materials, except by special forms.

The oil industry has P-98 which is designed to cover all repair and maintenance materials and form PD-200 for expansion and new construction projects. But literally hundreds of PD-1's have been filed by oil operators during the past few months because preference ratings assigned by the regular forms were not sufficiently high to permit procurement of some metals in which the shortage is most acute. In the case of some materials, the supplies are only sufficient to accommodate orders bearing the highest priority numbers. Consequently, the oil industry has been compelled to use the more general application forms in an effort to obtain higher ratings for certain supplies than afforded by P-98.

Conferences have been in progress through the past 2 weeks among district committees and communications have been forwarded to the OPC office at Washington, D. C., all concerned with revision of P-98 which is scheduled to be issued by WPB next week. The original P-98 expired March 2, was extended unchanged until March 15 and is now being revised for issuance as a permanent repair and maintenance order.

Questions and Answers on PD-1A

QUESTION: When do I use the PD-1A application blank?

ANSWER: An application may be made on a PD-1A form for a priority rating to obtain any material which you cannot obtain without a rating or by use of any rating to which you are already entitled.

QUESTION: Do I have to make out a separate application for every order to be placed with each of my suppliers?

ANSWER: Only when you are ordering different kinds of supplies or supplies to be used for different purposes. If you are assigned a rating to cover 100 tons of steel which is all to be used for the same purpose, you may use the rating on orders for 50 tons from one company, 25 tons from each of two others, etc. You may not use it, however, to obtain a larger total quantity than the amount approved on the certificate. If you need 50 tons of steel for one product and an additional 50 tons for another product, you must make out two separate applications.

QUESTION: May I use PD-1A to apply for a rating on construction work?

ANSWER: No. For construction, a project application should be filed on Forms PD-200 and PD-200A.

QUESTION: May I use a PD-1A form to apply for a rating on a machine tool?

ANSWER: PD-1A applications may be made for machine tools or other capital equipment if their use does not involve any physical expansion of your plant. When it is necessary for you to enlarge your plant to accommodiate additional tools, you should apply for a project rating for the expansion and a rating for the required tools in an accompanying letter.

QUESTION: What do I do with the PD-1A form when it is returned to me with a rating assigned by the Bureau of Priorities?

ANSWER: Keep the approved form in your file and apply the rating by endorsement on your purchase order. You do not need to send either the original or a copy to your suppliers as you did with the old PD-1 forms.

QUESTION: May a PD-1A form be used to apply for a higher rating when the rating assigned by a blanket order or a previously issued certificate is not high enough to secure delivery of the materials required?

ANSWER: Yes, provided you can accompany it with evidence that you have made every possible effort to obtain the material with the rating originally assigned.

QUESTION: Under what circumstances may I extend ratings assigned on PD-1A forms to replace material in inventory?

ANSWER: A rating may not be extended to replace materials in inventory if such extension would raise your inventory above a practicable working minimum.

If you fabricate or change the material in any way, you must extend the rating while the rated order is being filled.

If you are a supplier or distributor who does not fabricate or change the material to be delivered on a rated order, you may accumulate ratings for any one kind of material up to a maximum period of 3 months so that you can place a single order for the minimum quantity procurable on ordinary commercial terms.

Ratings may not be extended to cover a greater amount of material than is to be delivered to the company to which the rating was originally assigned. You are not permitted to apply a rating in anticipation of receiving rated orders.

QUESTION: May I extend a rating received on a PD-1A certificate on the same purchase order?

ANSWER: Yes. Any number of PD-1A certificates carrying the same rating may be extended on the same purchase order.

QUESTION: Must the endorsement by which I extend PD-1A to be on the actual purchase order?

ANSWER: It must be sent as a part of the purchase order, but a separate form may be printed and attached to the purchase order to carry the properly signed endorsement.

QUESTION: What does "physically incorporated" mean?

ANSWER: "Material physically incorporated" includes all commodities, accessories, parts, assemblies or other products which are physically or chemically incorporated in the end item described on the PD-1A certificate on which the rating has been assigned. This includes chemicals used in processing the end product or any part thereof, and packaging and containers specifically required under terms of the certificate on which the rating was assigned. Excluded are production facilities, machine tools, capital equipment and repair, maintenance and operating supplies.

QUESTION: May I reproduce Form PD-1A?

ANSWER: PD-1A is an application form, so it may be reproduced if the reproduction is exact.

QUESTION: What is a practical working minimum?

ANSWER: A practical working minimum means the smallest inventory which will enable you to keep your production processes operating efficiently. Unless the circumstances are exceptional, this should not be more than a 3 months' supply, or more than the amount of inventory you had on hand a year ago. In the case of certain scarce materials, maximum permissible inventory has been specifically prescribed by the War Production Board.

QUESTION: What is meant by a single kind of material for which a separate PD-1A application must be filed?

ANSWER: Materials included on a single PD-1A application must fall into one common class such as steel, paper, etc. One application may cover several sizes and shapes of steel products, or several items of any other single type or material.

QUESTION: What is meant by a single need or use for which a separate PD-1A application must be filed?

ANSWER: A single need is for a specific quantity of materials to be used in making one product or class of products. A single use is for one or more items of equipment or supplies to be used for a single purpose as described in the application.

Price Ceilings Are Removed From Aviation Gasoline

WASHINGTON, D. C., Mar. 9.—Price ceilings were removed late last week from aviation gasoline of 91-octane rating or higher and components and materials used in its production were exempted from provisions of Schedule 88.

Action was taken by the OPA because of the necessity for increasing production of aviation gasoline for military purposes. Government agencies charged with the procurement of materials essential to the armed forces had asked removal of any obstacles to speedy performance of the program for increasing production of aviation gasoline.

The amendment makes these exemptions from Sections 1340.151 and 1340.159 from Revised Price Schedule 88:

"(*a*) All aviation gasoline of 91-octane rating or higher.

"(*b*) The following to the extent purchased or sold for use in the manufacture of aviation gasoline of 91-octane rating or higher: Components of aviation gasoline of 91-octane rating or higher, including alkylate, neohexane, isooctane, hydrocodimer, isomate and hot acid octanes; and aromatic hydrocarbons and base gasoline stocks or fractions manufactured for and used in aviation gasoline of 91-octane rating or higher; also isopentane, isobutane, normal butane and butylenes."

Exemptions from maximum prices, permitted by the amendment, apply with equal force not only to government purchases of aviation gasoline but also to intercompany transactions in components and materials to the extent that they are used in the manufacture of the stipulated grades of aviation gasoline.

OPA retains a check on prices paid in all intercompany and other transactions by stipulating that contracts covering them must be filed with the administrator.

Deadline for Reporting Oil Prices Extended to March 23

WASHINGTON, D. C., Mar. 10.—Additional time for reporting crude oil-sale prices to the OPA was granted last week by the OPA. The advanced reporting date is March 23. The extension was granted when some producers indicated it would be impossible to report by March 5, the date originally specified in Price Schedule 88.

Under the price schedule (Section 1340.154) "all purchase prices for crude oil as of October 1, 1941, whether or not such purchase prices were posted, shall be filed with this office within 30 days after the effective date of this schedule (Section 1340.151 to 1340.159, inclusive). Purchase prices for crude petroleum described above may be submitted in the form of such price schedules or price lists as were in use on the dates specified, provided such price schedules or price lists are corrected to indicate any variance between the schedule or list price and the purchase price.

"Where a contract was in effect as of October 1, 1941, for the sale of crude petroleum at the well in excess of the posted purchase price for the pool involved, duly authenticated copies of such contracts shall be filed with this office within 30 days after the effective date of this schedule."

Eastern Stocks Decline; Tank-Car Movement High

Petroleum stocks in the East Coast area continued to decline despite high movement of crude and products by tank cars.

The Office of Petroleum Coordinator reported East Coast stocks of crude and products totaled 54,540,000 bbl. on February 28, exclusive of approximately 1,000,000 bbl. of imported petroleum in bonded storage, indicating a decline of 2,599,000 bbl. Crude-oil stocks in remainder of the country increased 3,512,000 bbl.

Daily average tank-car movement of petroleum into the eastern states was 323,775 bbl., a slight reduction from the week ended February 21 when rail shipments averaged 326,638 bbl. daily. The decline, OPC reported, may be explained by the fact that many of the more than 2,000 additional cars which were placed in West-East service earlier in February had not yet had time to be returned to loading points. The turnaround time for Texas-East Coast movement, the OPC reported, is 18 to 19 days.

The figures are based on loading reports covering 10,073 cars during the week ended February 28, calculated on a conversion factor of 225 bbl. per car. During the previous week there were 10,162 cars loaded.

Texas Mid-Continent Will Meet in Dallas

DALLAS, Tex., Mar. 7.—Choice of Dallas as the convention city for the 1942 annual meeting of the Texas Mid-Continent Oil and Gas Association was announced by George Sawtelle, president. Dates for the meeting were set as October 8, 9, and 10, Mr. Sawtelle said.

M-68 Violators In California To Be Denied Allowables

WASHINGTON, D. C., Mar. 9.—Office of Petroleum Coordinator today issued an amendment to Recommendation 19, under which the California conservation plan operates, authorizing the production committee of District 5 to refuse to authorize allowables for wells upon which equipment has been installed or used in violation of conservation order M-68.

The amendment was issued on request of the committee which reported several instances of violation of M-68. Violators will be prohibited from producing and it becomes illegal to purchase or transport oil from wells of violators.

Sun Shipbuilding Launches High-Speed Texas Co. Tanker

CHESTER, Pa., Mar. 7.—A 14,150-ton oil tanker, the S.S. Colorado, was launched here last week at the Sun Shipbuilding & Drydock Co. Sponsor of the vessel was Mrs. Katherine Dunn Dodge, wife of H. W. Dodge, vice president and general sales manager of the Texas Co., owner of the vessel. Mr. Dodge is at present serving with the War Production Board in Washington, D. C.

Like her sister ship, the Kentucky, which was launched January 3, the Colorado is a high-speed, steam-turbine tanker with a guaranteed speed of 16 knots. She will be ready for her trial runs early in May. A third vessel, the Montana, will be launched this month, and three additional Texas Co. tankers will be delivered in 1943.

The new ship is 514 ft. long over all, with a moulded beam of 68 ft. and a moulded depth of 36 ft. She has a capacity of 107,100 bbl. of gasoline and oil.

Parten Succeeds Gilbert As OPC Transportation Chief

WASHINGTON, D. C., Mar. 10.—H. A. Gilbert, former president of the Oil Transfer Corp., and director of the OPG transportation division in recent months, will become special assistant to the deputy coordinator. Maj. J. R. Parten, president of Woodley Petroleum Corp. and chairman of Premier Oil & Refining Co., Houston, Tex., will become head of the OPC transportation section and will continue as a member of the coordinator's Tanker Control Board. (A biographical sketch of Major Parten appears on Page 89 of this issue.)

Underwood Photo
H. A. GILBERT

Details of Mr. Gilbert's new assignment in the OPC organization have not been completed. He established Oil Transfer Corp., an independent company owning barges and tugs operating on the Atlantic Coast between Maine and Virginia and on all inland waters between the Hudson River and, via the New York State Barge Canal, to all points on the Great Lakes.

Earlier in his career, Mr. Gilbert joined the Standard Oil Co. of New York in 1908 and served with it and succeeding companies until 1917 when he joined the Navy. He was assigned to the Naval Overseas Transportation Service and in that capacity handled 23 tank vessels and eight coal colliers as officer in charge of operations under the supervisor of the Third Naval District.

Mr. Gilbert joined the Interocean Oil Co. as manager, operating 16 tank vessels. Part of the fleet consisted of time-chartered British and Norwegian vessels and the balance American boats under managing contract for United States Shipping Board. He remained with this company until organizing Oil Transfer Corp.

Industry Council Launches Conservation Plan In South

DALLAS, Tex., Mar. 9.—The Petroleum Industry War Council's educational campaign for the care of cars and tires was extended to District 3 Monday when advertising representatives of oil marketing companies met here.

"Care for your car—for your country" was the slogan adopted for current use in mass advertising media while the other national slogan, "Oil is ammunition, use it wisely" will be used if and as needed in industrial media. Owing to the surplus of gasoline in District 3 the car slogan was deemed much more applicable for use with the general public in this section.

The meeting was called by George C. Gibbons, District 3 advertising chairman for the council. A vice chairman, secretary and permanent committee will be appointed soon.

De Golyer to Address Spring Meeting of A.P.I. March 27

DR. E. DE GOLYER, director of conservation, Office of Petroleum Coordinator, will be the principal speaker at the "Win the War" dinner of the spring meeting of the Mid-Continent section, American Petroleum Institute, to be held at Tulsa March 26-27. The dinner will be the final feature of the meeting and will be held at the Mayo Hotel. Members and guests are invited to attend the dinner.

The 2-day program will carry out the keynote which has been adopted by the API Division of Production which is "All-Out Cooperation to Win the War." This slogan will be the theme of the Friday afternoon meeting at which Wirt Franklin, director of production in District 2 of the OPC, will speak. Prominent operators in the Mid-Continent area will participate in this session.

The Thursday and Friday morning sessions will be devoted to the presentation of technical papers dealing with drilling and field production problems.

Preliminary program, spring meeting, Mid-Continent district, Division of Production, American Petroleum Institute, which will be held at the Mayo Hotel, Tulsa, March 26-27, 1942, follows:

Thursday, March 26

8:00 a.m. Breakfast meeting for presiding officers, speakers, and discussers (French Room, Mezzanine floor, Mayo Hotel).

8:30 a.m. Registration.

10:00 a.m. Morning session (Junior Ballroom, Mayo Hotel), presiding: George Berlin, Skelly Oil Co., Pampa, Tex.; H. F. Beardmore, Amerada Petroleum Corp., Tulsa.

Salt-Water Disposal Systems, H. H. Elliston, Sinclair Prairie Oil Co., Tulsa.

Use of A.P.I. Specifications in Standardization of Oil-Well Pumps, B. L. Remick, Gulf Oil Corp., Tulsa.

12:15 p.m. Luncheon for district chapter officers (French Room, Mezzanine floor, Mayo Hotel).

2:00 p.m. Afternoon session (Junior Ballroom, Mayo Hotel), presiding: R. P. Moscrip, Shell Oil Co., Inc., Wichita, Kans.; J. T. Montgomery, Phillips Petroleum Co., Bartlesville, Okla.

Economic Technology of the Water Drive, Harry M. Ryder, Ryder-Scott Co., Bradford, Pa.

Pressure Maintenance—K.M.A. Field, William H. Rouzer, K.M.A. Engineering Association, Wichita Falls, Tex.

Pressure Maintenance—South Burbank Field.

Friday, March 27

8:00 a.m. Breakfast meeting for presiding officers, speakers, and discussers (French Room, Mezzanine floor, Mayo Hotel).

9:30 a.m. Morning session (Junior Ballroom, Mayo Hotel), presiding: C. D. Miller, Barnsdall Oil Co., Tulsa; Ralph Clark, Gulf Oil Corp., Tulsa.

Sabotage in the Oil Industry, W. G. Bannister, F.B.I., Oklahoma City, Okla.

Simplification of A.P.I. Casing Sizes, H. W. Ladd, Stanolind Oil & Gas Co., Tulsa.

Practical Results of Vocation Training, M. L. Powers, director, Trade and Industrial Education, Stillwater, Okla.

2:00 p.m. Afternoon session (Crystal Ballroom, Mayo Hotel).

"The Oil Industry in National Defense."

This session will be devoted to speakers from the Office of the Petroleum Coordinator and from the industry, including Wirt Franklin, director of production, District 2, Office of Petroleum Coordinator.

7:00 p.m. Friday, March 27, "Win the War" dinner, Crystal Ballroom, Mayo Hotel. Guest speaker E. De Golyer, director of conservation, Office of Petroleum Coordinator, Washington, D. C.

Tank-Car Loading Racks Spreading in Southwest

EXPANSION of tank-car loading facilities in the southwestern producing states was announced this week by companies supplying crude to East Coast refineries.

Sun Oil Co. has arranged to ship crude from East Texas over the Houston Oil Co.'s 56-car loading rack at Kilgore, Tex. Movement will be northeast to the Sun company's refinery at Marcus Hook, Pa. Magnolia Petroleum Co. is building three loading racks in Oklahoma. One at Oklahoma City is designed to load 42 cars daily. A 25-car rack is being built at Healdton and another of similar size at Maud, Okla.

Meanwhile, tank-car owners have begun to convert a number of ordinary railroad tank cars into cars capable of transporting essential liquefied petroleum gases used in making 100-octane gasoline and other war products, it was reported today to Petroleum Coordinator Harold L. Ickes.

A green light for the conversion program was given by the Interstate Commerce Commission, which approved the placing of the first experimental converted high-pressure car into service.

Experiments to convert ordinary tank cars into the high-pressure type were conducted at Coordinator Ickes' suggestion to help meet the demand for liquefied petroleum gases. Gases of special types are required for the manufacture of 100-octane gasoline and also are used extensively for heating purposes by war industries.

The first experimental converted car was approved by the tank car committee of the Mechanical Division of the Association of American Railroads, which filed the petition with the Interstate Commerce Commission.

Three benefits to the war effort will result from the conversion program:

1. An adequate supply of tank cars will become available to meet current and potential transportation needs for liquefied petroleum gases, such as isobutane.

2. Tank cars that were transferred to haul isobutane and other essential products can again be used exclusively to transport propane and other higher-pressure liquefied petroleum gases that are also necessary to war industries.

3. Both the time and steel required to build new high-pressure cars can be used for other important war work.

Only 30 days were required to convert the first experimental car from an ordinary tank car into one that will carry liquefied petroleum gases. Hereafter, even less time will probably be required.

Three Southern States Asked to Lower Production

WASHINGTON, D. C., Mar. 9.—Reduction of crude-oil production in District 3 by 204,100 bbl. daily under previously recommended rates was called for last week by Petroleum Coordinator Ickes in messages to the regulatory bodies of the five southwestern states.

The telegrams mentioned the interference with tanker transportation from Gulf Coast ports to the Atlantic seaboard, and added:

"Situation shows no prospect of immediate improvement so in order to balance crude-oil production with available transportation facilities and to avoid filling crude and products storage to distress levels, it is advisable to reduce the March crude-oil production of District 3 by 204,100 bbl. daily below production rates previously recommended to supply unobstructed demand.

"This necessary reduction in crude-oil output should apply to fields other than those from which entire present production is required for aviation gasoline, toluene, butadiene and aviation lubricants.

"Revised daily rates of production recommended for District 3 states for March are: Arkansas 71,500, Louisiana 314,700, Mississippi 53,100, New Mexico 100,200, and Texas 1,338,600. The production of each state should be adjusted to the revised recommended rates as soon as possible to avoid further serious dislocations."

East Coast Committee Asks Curb on Gasoline Delivery

WASHINGTON, D. C., Mar. 10.—Petroleum Coordinator Ickes today received the report of a special committee of the oil industry which has been considering the East Coast shortage situation.

It is understood the committee recommends government action to limit deliveries of gasoline to filling stations at a level 25 per cent below the corresponding month of last year, and also some restrictions on fuel-oil deliveries. Such limitations would be preliminary to setting up a consumer gasoline rationing system. The committee represented the refining, transportation and marketing committees of District 1 and was headed by John Brown, president of Socony-Vacuum Oil Co., Inc.

Coordinator Ickes and Deputy Coordinator Davies were studying the report today and it was probable that they would ask the War Production Board to issue limitation order as soon as technical details can be worked out.

Mid-Continent Group Selects San Antonio Convention City

San Antonio, Tex., was selected as the convention city for the eighth annual joint meeting of the standing committees of the Mid-Continent Oil and Gas Association in 1942.

Pipe Lines Prepare to Increase Northern-Eastern Shipments

THE recent refusal of WPB to permit the building of a pipe line between East Texas and the New York-Philadelphia area indicates that the Atlantic seaboard must rely mainly on tanker and tank car deliveries for petroleum supplies for some time to come.

Although pipe-line systems of the country cannot deliver a large percentage of what is required at East Coast points, existing lines can contribute by utilizing present systems to the fullest extent. Texas-Empire Pipe Line Co. will start operating a loading rack next week at the junction on its main line at Heyworth, Ill., which will be capable of loading 5,000 bbl. in 26 cars daily. Sinclair Refining Co. is carrying on an extensive program for enlarging the capacity of the trunk line running north. In addition to starting work next week on looping 22 miles with 14-in. pipe between Drumright and Prue, Okla., the company is preparing to place the Greeley, Kans., and the Buckner, Mo., stations in operation as soon as equipment can be procured and installed. In recent years the Greeley station has been almost completely dismantled. Plans call for the installation of pumps driven by electric motors. Buckner will be a diesel-powered station, using equipment which has been idle. It is expected that it will be several weeks before the company will get the benefit of the additional capacity which this program will provide.

Consideration is being given, by those studying the situation, to the possibilities of converting the operation of both the Plantation and Southeastern Pipe Line systems so that they may handle large shipments of burning oil which would go north by tank car from the northern part of the trade territory which they serve. Although pumping equipment is still being installed, it is reported that the Plantation system is already moving refined products at slightly more than half the rated capacity.

A temporary pumping equipment is reported to have been put in operation on the Southeastern Pipe Line while permanent equipment is being installed. Attention has been directed to a contribution to solving the emergency transportation problem through the laying of lines between Texas and the Mississippi River, for which pipe might be obtained by digging up lines in areas where there is excess capacity.

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Oil Council Is Considering Economic War Program

WASHINGTON, D. C., Mar. 9.—Three broad economic principles for guiding the petroleum industry through the war period were submitted here last week for consideration of the Petroleum Industry War Council. Suggestions come from the council's committee on economics headed by Dr. R. E. Wilson, New York, president of Pan American Petroleum & Transport Co. The general concepts suggested were:

1. Construction of new facilities so far as possible should be deferred until the post-war period, and where such construction is necessary it should be so located and planned as to minimize the use of materials that are scarce.

2. Where supplies are short, nonessential demands should be modified, shifted or curtailed.

3. Where transportation is the bottleneck, available facilities must be used in a way to give maximum efficiency.

The committee then listed nine specific problems which it suggested should be included among those to be attacked. They are:

1. Prepare an estimate of military, industrial and civilian requirements for petroleum products for 1942 and 1943. These schedules will constitute the fundamental bases for many other studies and hence it is essential that they be carefully prepared in the light of all available information and that they be kept up to date.

2. Tabulate the existing and potential sources of supply by regions with relationship to available crude supplies and byproducts needed for military use.

3. Prepare and present to the council a supply program to meet the estimated requirements, drawing such requirements from those sources which would afford the greatest efficiency in the use of materials, manpower, transportation and time, without adversely affecting the supplies of byproducts needed for the war.

4. Prepare and submit to the council an analysis of the Western Hemisphere transportation situation with reference to the existing tanker shortage, studying possible remedial measures and the most efficient methods of using new and supplementary facilities.

5. Analyze estimates of civilian and industrial requirements from the point of view of the necessities of consumption, realizing that our products are essential to millions in the functioning of our war effort.

6. Analyze the effect of major new projects with the view of comparing with possible alternatives.

7. Study future dislocations of the industry likely to result from changes in demand as between products and regions, and prepare schedules of action in advance to meet these conditions.

8. Study the economics of the rubber situation in its effect upon the petroleum industry.

9. Study the economics of administered prices in their bearing upon operating results and national interests, and explore the possibilities of devising methods for freezing price levels without creating undesirable rigidities in interproduct and interregional price relationships.

DEATHS

WILLIAM COOPER ELLIOTT, 67, pioneer Oklahoma drilling contractor and independent oil operator, died at his Tulsa home of a heart ailment. He was a native of Parker's Landing, Pa., and came to Oklahoma in 1904. Surviving are his widow and daughter, two brothers and two sisters.

CLAUDE L. HIGHT, 38, Oklahoma City, Okla., was killed March 8 when a rig on which he was working collapsed.

FRED T. KELLEHER, 47, Wichita Falls, Tex., a driller in the North Texas district, died at his home last week, following an illness of 7 months.

CHARLES W. WHITAKER, chief clerk, producing department, Continental Oil Co., Rocky Mountain area, died March 3 in Denver.

ROBERT F. HAND, 58, former general manager of Standard Oil Co. (New Jersey) marine operations, and former vice president and director of the company, died at Plainfield, N. J., March 5. Mr. Hand retired in 1939 after serving the company for 37 years. He started with the organization as an office boy in 1902.

CARL DAUGHERTY, 69, pioneer oil producer in western Pennsylvania, died March 7 after a heart attack at Butler, Pa. Mr. Daugherty, a brother, Ward, and their father, the late W. H. Daugherty, founded the Daugherty Refining Co., at Petrolia, Pa., in 1880. The plant is now operated by the I. Sonneborn Co. of New York.

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Fuel-Oil Equipment Denied Public Building In East

WASHINGTON, D. C., Mar. 9.—No oil-burning heating equipment will be ordered or purchased for public buildings and other public works being constructed under the general supervision of the Federal Works Agency in 14 eastern states and the District of Columbia, it was announced last week.

The states affected are Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York east of Long. 77°, North Carolina, Pennsylvania east of Long. 77°, Rhode Island, South Carolina, Vermont and Virginia.

McClintock Joins WPB

R. Otis McClintock, president of the First National Bank of Tulsa, has accepted a position with the War Production Board at Washington and will serve as liaison officer between the board, the Office of Petroleum Coordinator and the Reconstruction Finance Corp. Mr. McClintock, who in addition to his banking activities has been associated with Mid-Continent oil operations for many years, has been granted a leave of absence from the bank. F. B. Parriott, president of Leader Oil Co., was elected chairman of the board of the bank to serve during Mr. McClintock's absence.

THE MARKETS*

CRUDE OIL: Prices are unchanged. Pipe-line curtailment of runs in Texas results in softer undertone there as well as in New Mexico and Louisiana. Prices firm in other sections.

REFINERY PRODUCTS: Fuel oils firm in all refining districts. Gasoline soft in Gulf Coast and Mid-Continent. Low prices for natural gasoline and lack of coastwise tankers contribute to disruption.

TANK WAGON AND POSTED DEALER: This phase of the markets is unchanged and apparently on firm ground.

FINANCIAL: Oil stocks continued moderate downward trend. Averages for 30 stocks week ended March 1: High, 21.99; low, 20.47; close, 20.67. Week ended February 28: High, 22.14; low, 21.37; close, 21.90.

*Details in the market section.

Eastern Venezuelan Fields Contribute to Record Yield

By J. P. O'DONNELL

NEW YORK, Mar. 10.—Final figures for 1941 further reveal the growing importance of the new eastern fields in Venezuela's production of crude oil. These fields, which reached an important production status only 2 years before, contributed substantially to the increase in Venezuela's output last year, which reached an all-time high of 228,131,000 bbl., more than 10 per cent of the world total and 22,698,000 bbl., or 11 per cent, above 1939, the previous peak. (See Table 1.)

In 1939 the new eastern fields, located within a radius of 75 miles in the adjoining states of Monagas and Anzoategui, were credited with a production of 2,926,056 bbl., less than 1.5 per cent of the country's total. In 1941 their production totaled 36,966,536 bbl. and was equivalent to more than 16 per cent of the output of all Venezuelan fields. The growth of these fields is summarized in the following table, which compares their production in 1939 with that of 1941:

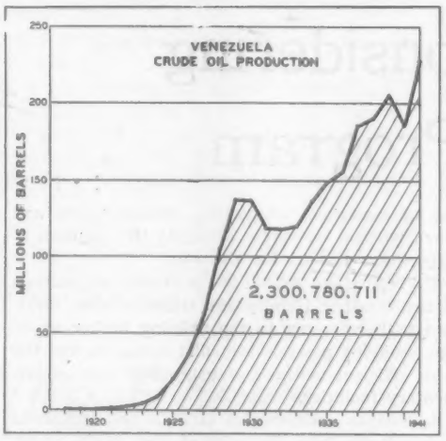
Field—	Barrels of 42 gal. 1939	1941
Oficina	2,347,642	24,465,405
Jusepin	512,296	7,197,882
San Joaquin	41,723	2,883,393
Santa Ana (MG)	24,395	181,816
Guario		109,346
El Roble		1,777,342
Santa Ana (Texas)		17,949
Leona		82,298
Santa Rosa		218,012
Santa Barbara		33,093
Total	2,926,056	36,966,536

Two Fields Discovered

Only one of the above fields was credited with production of consequence in 1938. This was the Oficina field, which produced 174,977 bbl. in that year. Jusepin, San Joaquin and Santa Ana (Mene Grande) were added to the production list in 1939 and the others in the last 2 years. Those added during 1941 were the Santa Rosa field, discovered by Mene Grande Oil Co. 11 miles northeast of El Roble, and the Santa Barbara field by Venezuelan Petroleum Co. 10 miles west of Jusepin. Other discoveries last year did not reach the production stage, but did provide evidence that the development of this area is far from complete. Further increases in this region's production are anticipated in the future as a result of additional outlets in the form of extensions to existing pipe lines and the construction of a new line from Santa Barbara to Puerta La Cruz, which is now under way.

TABLE 1—VENEZUELAN CRUDE-OIL PRODUCTION

	Total	Daily average	Per cent of world
1917	225,783	618	0.04
1918	367,304	1,006	.07
1919	258,478	708	.05
1920	526,119	1,437	.08
1921	1,498,052	4,104	.19
1922	2,398,004	6,569	.27
1923	4,757,152	13,032	.47
1924	9,155,114	25,014	.90
1925	20,409,137	55,915	1.91
1926	36,929,987	101,178	3.36
1927	63,176,760	173,087	5.01
1928	105,761,531	288,966	7.97
1929	137,535,230	376,809	9.24
1930	136,987,862	375,308	9.64
1931	118,878,971	325,696	8.65
1932	118,110,000	322,705	9.02
1933	120,442,000	329,978	8.35
1934	136,361,000	373,592	9.00
1935	148,889,000	407,915	9.01
1936	155,913,000	425,992	8.67
1937	186,856,000	511,934	9.14
1938	190,472,000	521,841	9.57
1939	205,433,000	562,830	9.89
1940	186,134,000	508,563	8.67
1941	228,131,000	625,017	10.28



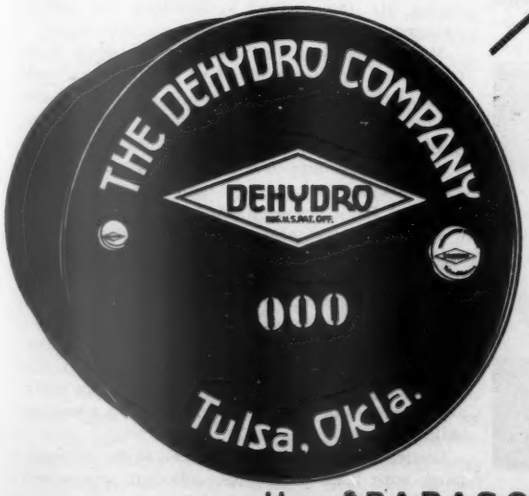
Lagunillas Largest Producer

While the closely grouped fields in western Monogas and Anzoategui provided the most spectacular developments last lear, the old-established fields continued to supply the bulk of Venezuela's production. Lagunillas and Tia Juana on Lake Maracaibo together produced more than half of Venezuela's oil in 1941 and even Mene Grande, another lake field and the country's oldest, increased its daily production by almost 5,000 bbl. Lagunillas passed the billion-barrel mark in total production during the year. The three most easterly fields, Quiriquire, Pedernales and Temblador, and El Mene and Media, two of the smallest western fields, registered the lone declines in 1941.

Despite the large gain in production last year, development of Venezuela's fields continued in an orderly fashion. Well completions for the year were 437 against 429 in 1940 and 415 in 1939. Had it not been for extensive wildcatting and the development of new areas, like Santa Barbara where 10 wells were completed, total completions in 1941 would have been less than in the previous year. However, there were about 25 per cent more rigs in operation on December 31, 1941, than on the corresponding date a year earlier. A large number of wells that had been shut in were returned to production last year as demand in the Western Hemisphere expanded.

TABLE 2—SUMMARY OF VENEZUELAN PRODUCTION AND WELLS

	1940 Total production	1940 Daily average	1941 Total production	1941 Daily average	Total to December 31, 1941	Well data as of December 31, 1941: New wells drilling	Nat. flow	Gas/air lift	Pumping	Closed in	Inactive	Abandoned	Total wells drilled	Wells completed Jan.-Dec. 1941
North field	19,324,559	52,799	21,967,320	60,184	406,088,534	2	158	13	690	85	304	130	1,380	69
Tia Juana	36,946,186	100,946	49,071,272	134,442	204,780,733	3	192	32	285	26	21	2	558	29
Lagunillas	58,464,785	159,740	70,136,192	192,154	1,016,813,306	1	246	23	847	149	171	86	1,522	95
Bachaquero	1,682,959	4,598	819,064	2,244	6,874,987	2	26	0	0	28	31	0	85	8
Total Lake fields	116,418,489	318,083	141,993,848	389,024	1,634,557,560	8	622	68	1,822	288	527	218	3,545	201
La Paz and Concepcion	1,288,199	3,520	1,620,771	4,440	29,075,916	1	12	0	61	53	16	6	148	7
Tarra and Manueles	6,196,869	16,931	6,649,123	18,217	68,970,613	2	27	1	57	12	25	19	141	11
Mene Grande	10,812,402	29,542	12,496,698	34,238	232,859,723	2	44	17	164	76	129	23	453	21
El Mene and Media	321,803	879	244,928	671	24,847,582	0	4	17	24	133	0	146	324	0
Cumarebo	1,630,785	4,456	2,069,285	5,669	28,222,482	0	40	1	14	38	11	14	118	0
Quiriquire	21,676,451	59,225	20,568,628	56,352	192,824,501	0	100	0	47	122	12	15	296	0
Pedernales	1,795,888	4,907	1,584,432	4,341	8,762,574	0	9	0	0	2	4	4	19	0
Temblador	3,994,215	10,913	3,300,488	9,042	13,301,363	0	61	0	0	12	2	15	90	0
Oficina	15,414,106	42,115	24,465,405	67,029	42,422,147	8	168	10	3	20	22	25	248	104
Jusepin	3,995,154	10,916	7,197,882	19,720	11,709,152	6	76	0	0	16	4	3	99	42
San Joaquin	1,097,562	2,999	2,883,393	7,900	4,022,678	2	18	0	0	1	0	1	20	10
Guario	16,033	44	109,346	300	124,763	2	0	0	0	3	0	0	3	2
El Roble	654,379	1,788	1,777,342	4,869	2,433,546	2	5	0	0	0	0	0	5	3
Santa Ana (M.G.O.)	75,790	207	181,816	498	293,024	0	2	0	0	1	0	0	3	1
Santa Ana (Texas)			17,949	49	17,949	1	0	0	0	1	0	0	1	1
Leona	17,551	48	82,298	226	100,080	4	1	0	0	10	0	1	12	10
Hombre Pintado	658,093	1,798	562,831	1,542	2,078,395	1	3	8	9	13	0	9	42	5
Las Palmas	42,461	116	25,157	69	373,776	0	0	0	3	1	5	4	13	0
Santa Rosa			218,012	597	218,012	2	1	0	0	0	0	2	3	1
Netick			26,529	73	108,351	1	0	0	0	2	0	1	3	1
Santa Barbara			33,093	91	33,093	5	0	0	0	10	0	0	10	10
Others	28,160	77	21,884	60	3,423,431	5	1	0	0	44	2	354	401	7
Total Venezuela	186,134,390	508,564	228,131,138	625,017	2,300,780,711	52	1,194	122	2,204	858	759	880	5,997	437



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Natural Gas News

Appalachian Short Course Meeting Date Deferred

MORGANTOWN, W. Va.—The general committee of the Appalachian Gas Measurement Short Course deferred selection of a 1942 meeting date at a recent gathering here at West Virginia University. The pressure of war materials business, personnel shortages and other factors would tend to limit general participation in a school this year.

The committee voted to hold a committee meeting later at the call of the chairman in the event that developments warrant such a meeting or indicate the opportunity or necessity of a school during 1942.

The general committee organization is to be held intact until after the next school is conducted and that operating committees for the next school appointed.

The following have been appointed to subcommittee chairmanships for the next meeting of the school:

Program committee, Joseph M. Low, chairman, Hope Natural Gas Co., Clarksburg, W. Va.; banquet and entertainment committee, A. D. MacLean, chairman, Pittsburgh Equitable Meter Co., Pittsburgh, Pa.; housing and registration committee, W. A. Staab, chairman, West Virginia University, Morgantown, W. Va.; exhibits committee, J. W. Allison, chairman, Monongahela West Penn Public Service Co., Morgantown; publicity committee, R. S. Reed, Jr., chairman, Pittsburgh Equitable Meter Co.

Educational committee, H. J. Wagner, chairman, West Virginia Public Service Commission, Charleston, W. Va.; publications and merit awards committee, G. R. Spindler, chairman, West Virginia University; practical methods committee, Report 3, C. B. Heist, chairman, Manufacturers Light & Heat Co., Pittsburgh; general committee, J. E. Overbeck, chairman, Columbia Engineering Corp., Columbus, Ohio; executive committee, G. R. Spindler, chairman, West Virginia University.

Basic Gas Information Sought From All Concerns

The Federal Power Commission has requested from every natural-gas producer, pipe-line company, and distributor in the country basic operating information to be used by the commission and other governmental agencies to assure natural-gas supply to war industries. The information is similar to that recently requested from all natural-gas companies east of the Mississippi River and north of Tennessee and North Carolina to work out methods to avert a serious shortage of natural gas which threatens certain sections of the Appalachian area next winter.

Forms have been sent to operators requesting essential operating information together with a map of pipe-line facilities owned or operated and this information is asked for not later than March 31, 1942. A total of 356 companies have been asked to submit information with respect to physical properties, together with actual 1941-42 and estimated 1942-43 figures on system gas balance and system peak-day deliverability and demand; transmission system deliveries; distribution system sales; and gas reserves and production owned or controlled through purchase contracts.

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Antiwaste Advertising Planned

DISTRICT advertising representatives who will carry out the plan approved early last month by the Petroleum Industry War Council to publicize the immediate need for elimination of preventable waste of petroleum products and the conservation of automobiles and automobile tires met for the first time last week to hear the council's plan. The district representatives will act under the subcommittee on product conservation headed by B. I. Graves, Tide Water Associated Oil Co., chairman. Other members of this committee are W. H. Kershaw, Texas Co., and J. A. Miller, Standard Oil Co. of New Jersey.

District representatives are: District 1, H. L. Curtis, Shell Oil Co., Inc., New York; District 2, Wesley I. Nunn, Standard Oil Co. of Indiana, Chicago; District 3, George C. Gibbons, Mid-Continent Oil and Gas Association, Dallas; District 4, George B. Cramer, Powerine Co., Denver, Colo., and District 5, John H. Weiser, Gilmore Oil Co., Los Angeles, Calif.

There will be no joint advertising program by the oil companies, but each company will be encouraged to carry slogans and other material prepared by the subcommittee in company advertising. The plan, as it has been approved by the council, was enthusiastically approved and encouraged by Petroleum Coordinator Harold Ickes.

The advertising material which will be used includes two 24-sheet posters which may be obtained from the committee, one of which incorporates the slogan "Oil Is Ammunition — Use It Wisely" and pictures a tank, plane and battleship while the other features the slogan "Care for Your Car—for Your Country" and shows an American eagle and a group of motor cars. Other material for reproducing *A* sign posters, copy and illustrations for pump hangers, two booklets which emphasize the two slogans and contain different sets of rules which the motorists should follow, stickers for windshields, speedometers and road maps and suggested layouts for postal-meter machine designs are provided.

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Oil Industry's Scrap-Collection Plan Spreads

The petroleum industry scrap-collection campaign, started in Texas by the Texas Mid-Continent Oil and Gas Association, spread to two other states this week as Oklahoma and New Mexico organized to "get in the scrap."

The Oklahoma organization was set up at a meeting held Tuesday at Oklahoma City by E. H. Moore, general chairman for scrap collection in that state. In New Mexico the campaign is being directed by the New Mexico Oil and Gas Association with Hugh L. Sawyers of Roswell, its secretary, as chairman.

Collection committees for the four principal oil-producing counties in New Mexico have been set up by Mr. Sawyers with the following chairmen: Tom Mason, Continental Supply Co., Hobbs; Tom Sivley, Union Supply Co., Artesia; Ras Barker, Petroleum Products Manufacturing Co., Prewitt; and Harry Clark, Continental Oil Co., Shiprock.

Although collection of oil-industry scrap has been going on in New Mexico for some time, a thorough search is now being made to get any which has been overlooked, Charles F. Roeser, of Fort Worth, general chairman of the scrap program for District 3, said.

The Texas scrap drive has been unusually gratifying, Mr. Roeser said in thanking the county chairman and cochairman and committeemen.

Mr. Roeser has just received a letter from George T. Weymouth, chief of the industrial salvage section of the Bureau of Industrial Conservation of the War Production Board, praising the oil and gas industry for its campaign.

"This letter happened to be addressed to me as chairman," Mr. Roeser explained, "but it is intended for every men working on the drive."

More than 200 carloads of scrap metals and rubber have already been shipped to Texas or eastern mills from the Texas Mid-Continent Oil and Gas Association campaign, Charles F. Roeser, general chairman, reported.

"This is based on incomplete reports, with some counties not yet reporting," Mr. Roeser said. "It is also only of scrap actually shipped out. In some areas, large amounts more are piled up awaiting shipment."

Leader for any collection center so far is Beaumont with 2,262 long tons, collected, and more coming in. Scott W. Myers of Beaumont is chairman and B. G. Dowell of Saratoga, cochairman. The 2,262 tons represents about 50 carloads.

Fred P. Dodge, of Port Arthur, Tex., is cochairman for Jefferson County.

ENGINEERING AND OPERATING SECTION

MARCH 12, 1942

Drilling Methods at Chapel Hill

By T. P. SANDERS

UNUSUAL difficulties have been found in drilling the Chapel Hill field of Smith County, East Texas. A surprisingly large number of the wells, ranging in depth from 5,700 to 8,500 ft., have experienced very costly fishing jobs in spite of the fact that all ordinary precautions have been taken to guard against sticking of the drill pipe. Experience gained in the 3½ years since the first well was completed has led to the introduction of remedies that appear to be successful in overcoming the most serious problems, but as yet there is no general acceptance of the innovations, and there is comparatively little uniformity in the practices of the drilling firms participating.

Chief factor contributing to difficulties is the formation sequence. Reasonably soft strata exist down to the Georgetown lime at about 4,400 ft., but below that point the drilling is almost entirely in hard limestones. The slow progress at depth necessitates frequent round trips through the long-exposed upper formations causing trouble.

There is lack of agreement as to the immediate cause of the many fishing jobs that have occurred, but all accounts agree in that they mention sudden seizure of the drill pipe while coming out of the hole. Among the operators there is a slight majority attributing this seizure to key seating, while the other operators are inclined to blame swelling or sloughing of certain formations as a result of water loss from the drilling mud.

Unless one or more of the troublesome holes is gaged by means of the electrical recording caliper recently introduced, it will never be definitely known whether the cause of stuck drill pipe is key seating, swelling of shale, or formation of filter cake on sand faces. Those rejecting the key-seating theory contend that the holes they have drilled do not deviate enough from the vertical at any point to foster key seating. They also note that the tight places in the hole are not always found at the same depths when the pipe is being pulled.

R. C. Johnston, drilling superintendent for Delta Drilling Co., points out that the strata found in the vicinity of the Pecan Gap, at about 2,400-ft. depth, are of the type in which key seating is most likely to occur. Comparatively thin limestone members are separated by soft shale bodies. The shale is quite easily washed away by fluid circulation, thereby leaving the sharp limestone members projecting into an enlarged hole. At depth, when the drilling progress is often reduced to 1 ft. per hour, there is plenty of time for the drill pipe and tool joints under tension to work their way into the limestone benches, being aided by the high velocity of fluid flow through these restrictions. It is not considered likely that key seating would occur in an absolutely straight hole, but is pointed out that change in direction is a more important consideration than amount of deviation. Even if the deviation is at no point greater than 2°, the sharp changes in direction, which are so likely to occur when the bit must penetrate alternating hard and soft members, would be capable of bringing about key seating under the drilling conditions existing in the field.

Present drilling campaign in the Chapel Hill field of Smith County, Texas, is for the exploitation of productive zones from 5,700 to 8,500 ft. During the 3½ years the development has been under way several practices have been developed for overcoming the difficulties encountered while drilling.

Principal trouble is credited to key-seating of the hole by the drill pipe, particularly in the alternating lime and shale sections. One company has increased the size of the hole drilled to the Austin Chalk as the larger hole is less likely to develop trouble from this cause. Another uses the smaller hole but exercises great caution in pulling the pipe from the hole, particularly through the dangerous sections.

As reconstructed by Mr. Johnston, the trouble is pictured as follows: In drilling the alternating limestone and shale members of the Pecan Gap, many sharp direction changes occur as the bit strikes the hard tilting surfaces, but vigilance of the driller prevents the bit from following any general course away from the vertical. With continued drilling the intervening shale is washed from between the lime streaks, and during the month or 6 weeks usually required to drill the hard formations below 4,400 ft. the drill pipe under tension works its way into the lime streaks, perhaps 8 or 10 in. at the points where there is a sharp change in direction. When the pipe is being pulled, the drill collar, bit, or reamer may easily become wedged in one of these wall recesses unless extreme care is taken.

The remedy introduced by Mr. Johnston for overcoming key seating would be equally successful in relieving difficulties due to shale swelling or filter-cake formation. Therefore its success does not necessarily prove that key seating has been responsible for the fishing jobs.

Overcoming Key Seating

In their first three Chapel Hill wells, Delta Drilling Co. followed the practice of cementing their 9⅝-in. casing as soon as they had reached a depth of about 1,300 ft. (This string was preceded by two joints of 13⅜-in. surface pipe.) Below 1,300 ft. all drilling was accomplished with 8¾-in. bits. On each of the three wells drilled under this program a serious fishing job developed, and in each case the sticking of the pipe was attributed to key seating. In subsequent holes drilled by the Delta firm, the 12½-in. hole has been carried down to the Austin chalk before cementing the 9⅝-in. casing at 1,300 ft. Thus the new program requires no additional casing, gives the same protection to the fresh-water sands, and provides a much larger hole through the troublesome portion of the strata.

There are several ways in which a larger hole serves to eliminate key seating. First, the greater

clearance minimizes the effect of small direction changes if the general course of the hole is vertical, and the result is that lateral forces tending to force the drill pipe against the walls of the hole may be eliminated. Second, the reduction of fluid velocity due to greater area helps to prevent enlargement of the hole in the soft-shale intervals. Third, if a key seat is formed there will be less likelihood that the drill assembly will be forced into it while the pipe is being pulled.

Since adopting the practice of drilling the larger hole through the critical depths, Delta Drilling Co. has completed five Chapel Hill wells and has two more in progress, and all have been successful in avoiding stuck drill pipe, which is an excellent record for the Chapel Hill field. Drilling of the larger hole consumes very little more time because the formations of the critical interval are predominantly soft.

Some operators in the Chapel Hill field have been successful in avoiding stuck drill pipe without resorting to the method described above. As a rule, these individuals depend upon careful pulling of the pipe to avoid getting stuck. All holes drilled in the field appear to have tight places where the pipe will become stuck if it is pulled rapidly. The fact that the pipe can be worked through these places if care is taken in pulling supports the belief that key seating is the cause of the trouble.

Practically all wells in the field have been drilled with carefully controlled mud, so it appears unlikely that stuck pipe has been caused by thick filter cake on the walls in any great number of cases. Water-loss tests are performed regularly at most rigs, the mud is kept alkaline, and the weight is maintained at approximately 10.2 lb. per gallon with viscosity usually in the neighborhood of 24. One operator reports good results from use of common baking soda in treating mud that has become cement contaminated Cement bubbles are quickly knocked out by addition of the soda, it is stated.

The number of bits required for an 8,300-ft. well indicates the hardness of the lower formations. Even when the 12½-in. hole was drilled to 2,800 ft., the record of a typical well shows that two 12½-in. rock bits were required for drilling that interval as compared with thirty-six 8¾-in. rock bits from 2,800 ft. to the total depth. However, one operaor drilling at present expects to complete his well with a total of 28 bits, which would represent a considerable reduction in rock-bit costs.

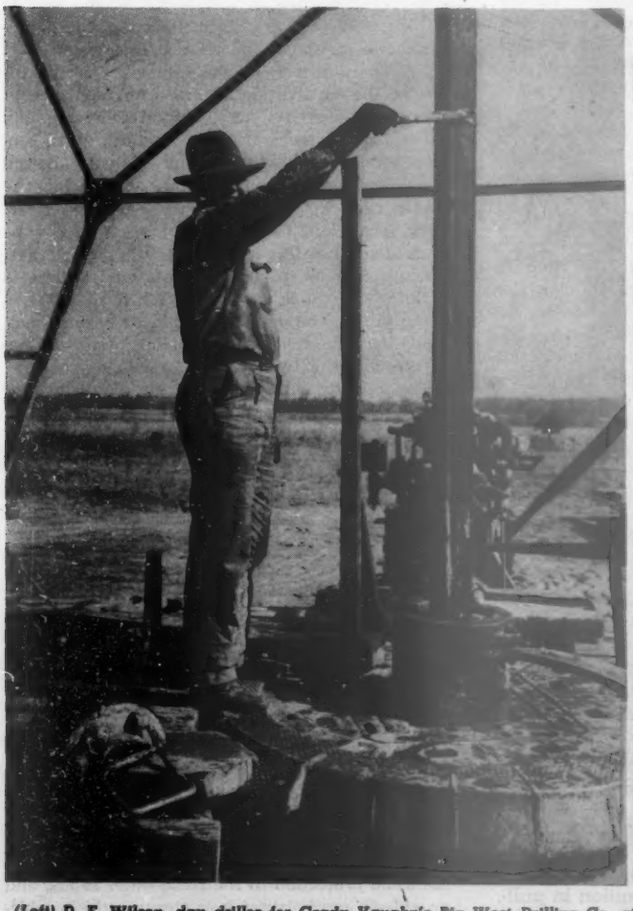
Dual Slim-Hole Completions

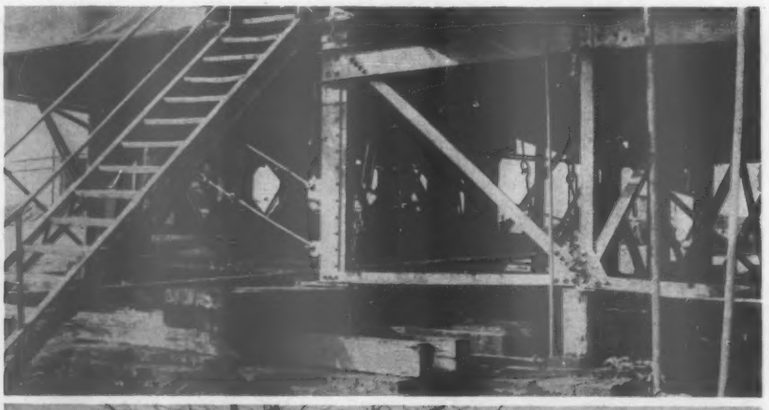
As a means of conserving steel and reducing well-investment costs, most concerns are now using 5½-in. pipe for the final casing string. Since there are four producing horizons, most owners seek and obtain permission from the Texas Railroad Commission to produce two zones in each well. This can be accomplished very satisfactorily because the two upper horizons produce distillate while the two deeper pays produce high-gravity oil. All four zones are not found to be productive throughout the field, and at most locations not more than two zones offer commercial production. From top down, the productive zones are the lower Paluxy, usually found between 5,700 and 5,800 ft.; the Rodessa section of the Glen Rose at approximately 7,350 ft.; the first Pettit lime break at about 8,150 ft.; and the second Pettit lime break at about 8,250 ft.

A dual completion is made to produce one of the distillate zones (usually the Paluxy) through the casing while oil from the Pettit lime is produced through the tubing. The casing is always cemented through both productive zones, using about 550 sacks of cement, which is enough to reach above the uppermost oil or gas show. The productive intervals are opened up with the gun perforator.

Completion practice of one large operator, whose work is typical, is as follows: Emphasis is laid upon proper conditioning of the mud before perforating in order to hold to a minimum the infiltration that is likely to take place when the bullets penetrate the productive strata. The distillate zone is first opened up, using 250 gun shots. The well is then brought in and produced for five days. If no difficulty, such as water production, develops, preparations are then made for bringing in the oil production. The well is first killed, then the drill pipe is run to remove any cement remaining in the bottom of the casing, and also to condition the mud in the bottom of the hole, then the pipe is removed and the lower pay is opened up with 150 gun shots.

In wells that were cased with 5½-in. pipe, a string of 2-in. tubing is installed, but 2½-in. tubing is still used in the wells having 7-in. casing. For dual completions a packer is run on the tubing, and after both productive zones are brought in by circulating, this packer is set in the casing between the two perforated intervals. Since the cost of a Chapel Hill well is high (usually around $75,000) the slim-hole dual completion is favored as offering the lowest necessary investment for the rapid payout possibilities afforded.





(Left) D. F. Wilson, day driller for Grady Vaughn's Big West Drilling Co. at Chapel Hill, marking the kelly during time-drilling operations as the hole nears completion. (Upper right) Concrete derrick corners are no longer used under most Chapel Hill drilling rigs. Timber mats are substituted to save investment in unsalvable materials. (Lower right) Heater used to prevent freezing of gas hydrates in fuel lines in drilling wells. The gas passes through tubes that are immersed in water within the 20-in. pipe while fire below heats the water bath.

Protection of Oil Storage From Bombs Difficult

By J. P. O'DONNELL

With the war drawing closer to the shores of the United States, it becomes apparent that one of the primary objectives during any attempted invasion will be the crude-oil and refined products storage and the refineries in addition to increased attacks on tankers. This article describes the types of bombs which have been used in the European conflict and the measures taken to protect oil storage and plants from these missiles.

THE concentration of Axis submarine attacks on tankers, the shelling of the Lago Oil & Transport Co., Ltd., refinery at Aruba, and the shelling of oil installations near Goleta, Calif., may be taken as an indication that when and if Axis air raids are attempted on this country they will be directed at oil properties. This is, of course, by no means certain and should not be accepted as a signal to launch a program of costly protective measures since a program providing even fairly complete protection for the whole industry would be of far greater expense to the country than the probable damage to oil-producing, refining, transportation, and storage facilities from air raids.

Refineries constitute the most vulnerable and inviting target. Oil tanks are considered second because they are important and easily recognizable. Pipe lines are considered a secondary objective since, in themselves, they are a most difficult target. Oil fields are included in this category also because with our existing excess potential, an attack on field installations could not be expected to have any great effect on our war effort.

Tanker Loss Serious

Except in a very few instances the effects of bombing permanent installations would be entirely local. Torpedoing of tankers strikes at the industry's most vulnerable point but as serious as these losses have been, the industry could survive them at their current rate without critical difficulties if it were not for the aid we have given our allies.

In the protection of storage tanks it is obviously impossible to consider camouflaging all of the vast number of tanks throughout the country. In the first place no satisfactory camouflage has been developed for disguising storage tanks located aboveground and it would be an obvious impossibility from an economic standpoint to place all of them underground.

Most damage to oil installations so far in this war has been accomplished with 100-lb. bombs and it is considered improbable that bombs larger than 500 lb. would be used against industrial plants. The 100-lb. bombs make craters ranging from 5 to 10 ft. in earth and about 1.2 ft. in continuously supported reinforced concrete. Craters made by 500-lb. bombs range from 12 to 23 ft. in earth, sand or gravel and 2.6 ft. in concrete. Tests made in England show that the required thickness of protection against fragments of 500-lb. bombs at a distance of 50 ft. for various materials are: mild steel plate, 1.5 in.; brick wall, 13.5 in.; plain concrete, 15 in.; reinforced concrete, 12 in.; specially reinforced concrete, 10 in.; sand or earth revetment, 2.5 ft.; gravel or stone between wood or corrugated-iron sheathing, 2 ft.

The greatest danger from the storage standpoint lies in fragments from high-explosive bombs. These fragments easily pierce oil tanks with sides ranging from 0.078125 to 0.1875 in. in thickness and readily start fires. Since the punctures are in a variety of shapes they are not easily plugged. However, attempts have been made to plug such punctures at some English terminals where a supply of varisized wooden plugs is kept on hand.

The most effective protection for storage tanks are "splinter" walls. Earthen walls are preferred since they are more effective and more easily repaired than concrete walls. Other methods can be used, such as building a brick wall about 1 ft. from the tank and filling the space between with low-grade concrete or by using adequate sand-bag barriers. It should be remembered that sand-bag protection is most effective when the bags are but half filled. Splinter walls may be built easily when there is ample space between the tanks.

When fire banks constitute the sole means of protection they should be at least 1 ft. higher than just enough to accommodate the contents of the tank. Conveniently located piles of sand bags are desirable for immediate repair of damaged banks. Drains to sumps from which spilled oil may be pumped to other tanks are also desirable. When tanks are closely bunched some may be retired from oil service temporarily and filled with water to serve as a fire stop.

Bomb hits on tanks are not necessarily accompanied by fire, especially if the contents are heavier than gasoline and even direct hits generally do not destroy tanks. Oblique hits may result in jagged holes and fire the contents but are unlikely to destroy the tank. Incendiary bombs have been known to burn through tank tops but more often than not such bombs are extinguished by submersion without firing the oil. Since they usually burn about 7 minutes there is often ample opportunity to extinguish them by spraying or by covering them with sand. Bombs set to explode upon striking have caved in parts of tanks above the liquid level.

Unquestionably the most vital requirement is the presence of the proper fire-fighting equipment manned by fire fighters who are acquainted with their task. Experience abroad shows that water-foam, produced by chemical solution, is most effective. Pits have been prepared or scattered tanks designated to hold water in case of lack or possible failure of the water supply. In these instances portable pumps are used.

Demolition bombs are the primary concern of refineries since they are designed for the purpose of destroying buildings. They may range from 50 to 4,000 lb. but the most commonly used are in the 500-lb. class. When dropped from a bomber traveling 200 m.p.h. they may strike the objective at an angle from 53° to 78° if the plane is flying at 2,000 or 20,000 ft., respectively. The impact velocity similarly ranges from 440 to 930 ft. per second.

Steel-frame structures, which include the bulk of refinery installations, are most resistant to the effect of bombing. Such structures, when designed on the principle of continuity, normally suffer only local damage. The most severe damage to be expected in oil refineries would be in small buildings such as pump houses.

Since the damage to pump houses could result in the shutdown of any or all units served by them, their protection is important. The simplest and most effective means of protecting essential machinery is the use of sand bags though wooden boxes filled with sand are also suitable. Another desirable precaution, whenever possible, is the storing of duplicates of vital machinery at points dispersed from the main buildings. This may include standby equipment which most refineries have. The policy of having duplicate machinery on hand is supposed to have been followed by Germans in their synthetic plants. From June 1940, to January 1, 1941, the R.A.F. raided German plants intensively and their apparent inability to score knockout blows is attributed to the Germans' immediately available replacements.

Sand bags can provide effective protection for isolated valves. Underground piping can be the source of considerable trouble especially if the line is filled with liquid and is of butt-welded construction. Shock of bomb explosions transmitted to such pipe has not only resulted in damage at the point where the bomb struck but has also resulted in splitting the pipe as much as a quarter of a mile in either direction. It is believed that seamless or electric welded pipe, most commonly used in this country, would not suffer such extensive damage.

There are other forms of protection that can be pursued such as blackouts and protection against sabotage. These were discussed in an article in the February 26 issue of The Oil and Gas Journal.

Protection from sabotage extends to placing guards around tanks in some cases

California Defense Program Is Aimed at Preventing Sabotage

By L. P. STOCKMAN

California operators are preparing for war contingencies now to prevent any extensive damage in case of a sudden emergency later on. Principal problems are the guarding against sabotage of producing, transporting, refining, and storage facilities and the protection of equipment from damage due to bombing.

PROTECTION of California oil fields, refineries, natural-gasoline plants, storage facilities, loading terminals and pipe-line systems was recently consolidated under the Oil Industry Protection Committee of which A. C. Rubel, vice president of Union Oil Co., is chairman, and of which George F. Prussing is engineer in charge of operations. The industry's efforts to prevent sabotage will help to assure an adequate supply of oil for the war period in the Pacific, and also minimize the possibility of uncontrolled fire and damage to property in areas surrounding oil fields and refineries.

The committee, composed of members representing various interests in the industry and various geographical locations in the state, is the outgrowth of the Oil Field Protection Committee, which was organized early in December to develop means of protecting oil fields themselves, and of a committee formed by the American Petroleum Institute to develop protection for storage, refining, loading and transportation facilities. This committee has developed a program which is based upon the formation of field committees in each field in the state and charged with protection of that particular field. Pooling of all fire-fighting equipment, maintenance of 24-hour telephone service from a central point, and intercommunication between the field committee and the military and civil authorities concerned in the immediate area have all been established.

Emergency Travel Permits

An example of the type of activity in which the committee has interested itself is the working out of a method of designating certain oil industry vehicles as emergency vehicles so they will be authorized to use the highways during a blackout. The committee has advised state authorities that, in the event of a fire in the oil fields or in a refinery, it may be necessary to assemble oil-industry fire-fighting equipment and crews from other areas than the one immediately concerned and that, to assure such assembling during a blackout, certain vehicles must be designated as emergency vehicles. Distribution of state emergency vehicle permits, so that they can use the highways during blackouts, has been made to 167 oil-industry automobiles and trucks by the Oil Industry Protection Committee. These permits will enable the oil industry to assemble men and fire-fighting equipment in case of an oil-field fire or refinery fire, even though general use of the highways may be restricted. Each vehicle bearing a permit will also be equipped with blackout lights and other accessories required by the state. The permits are issued by the state Department of Motor Vehicles and will be cleared by the Oil Industry Protection Committee in so far as the oil industry is concerned. The committee has also gone into the matter of identification of employes, so that those who may have to go through military cordons or fire lines will be permitted immediate access to the property. This matter is at present under discussion with designated authorities, as is also the question of proper control of traffic through oil fields.

In the northern part of the state, where there is little or no production of oil, but where there are many vital refinery, storage and loading facilities, the work is generally under the supervision of F. S. Clulow, vice president of Shell Oil Co., Inc. To his activities has been added the protection of such oil and natural-gas production as lies in the area.

In the southern part of the state, where oil fields and the production of oil predominate, emphasis is being placed on protection of fields, together with the protection of such refineries and natural gasoline plants as are located in them. Protective measures already developed for refining locations and for harbor loading facilities are being carried on by those who had been doing that work, and who are now represented on the general committee so that all efforts at prevention of sabotage and protection of oil-field property are coordinated. Members of the Oil Industry Protection Committee are A. C. Rubel, chairman; A. A. Jergins, vice chairman; R. A. Sperry, vice chairman; J. B. Hutchins, secretary; F. S. Clulow; F. E. Coyle; R. Fenton; H. P. George; P. S. Magruder; R. D. Montgomery; A. S. Patrick; C. C. Scharpenberg and George F. Prussing, engineer.

The shelling of production facilities in the Elwood field from a 5-in. naval gun on board a submarine and a subsequent air-raid warning which later resulted in a total blackout and anti-aircraft firing at reported enemy planes in Los Angeles brought home to the California oil industry the necessity of taking extreme precautions to prevent sabotage work and undertaking other protective measures to safeguard producing wells from damage by possible bombing. Heretofore there has been a feeling that there was little need for extensive precautions but this complacency has been undergoing a change. Most operators are very reluctant to remove derricks and while some have been removed it is the present custom to allow derricks to remain standing. Derricks in a pumping field are not any great source of danger but they do present a problem in a flush field where they might be knocked over and create a tangled mass thereby retarding control work in event of a direct hit on the christmas tree or the dropping of magnesium bombs on tanks or other inflammable material. This is also a very opportune time to clean up all leases and remove all debris so as to minimize the possibility of fires.

It has become common practice to build sandbag banks around flowing wells sufficiently thick to safeguard a well from everything but a direct hit. There is no generally accepted plan in effect to cope with direct hits as this has been considered impossible of achievement. Richfield Oil Corp., however, has gone further along this line than most other operators by putting all of its wells in the Wilmington field in bomb cellars which should protect wells from all but the largest of bombs. This is accomplished by cutting off the surface casing and lowering the christmas tree and other connections into the cellar. Finally a trap door is placed over the cellar which is reinforced with sand bags. Other operators in this field who do not want to go to the expense of dropping connections into the cellar are sand bagging all wells on the assumption that this type of protection will protect wells from fragments. Union Pacific Railroad, largest fee owner of productive acreage in Wilmington, and General Petroleum Corp., discoverer of the field and a large producer in the area, are finishing the job of erecting sand bag and earth protection around their respective wells.

Sand Bags for Christmas Trees

The generally adopted method of sand bagging a well consists of building a pyramid around the well head with sand bags properly spaced so that no weak spots remain. Operators learned early that proper ventilation must be provided to permit escape of any gas the well is making. Early pyramids failed to allow for this gas escape and others failed to provide a means of ingress and egress with the result that changes were necessary. On some installations control work can be done from the outside by means of extension bars. In several San Joaquin Valley fields, especially those in the flush stage, it has become common practice to throw up earthen embankments around each well high enough to protect the christmas tree and connections and large enough to permit easy access. In these late fields, it is customary to reduce wells to skeleton form by removing all drilling equipment including derrick, machinery and all other equipment. All that remains is the christmas tree and connections, gas trap and adjacent tanks. This makes it easy to throw up earthen embankments around each well. The sand bags used for protective purposes are not filled to capacity and thus they are able to conform to shape and are easier to place.

Refineries, natural-gas plants and tank farms are being protected in various ways although no method can be adopted that will protect such installations from direct hits. Additional control gates and sand bagging of small pressure equipment, however, provides some protection and permits easier control work. To take care of employes during bombing raids all plants provide air-raid shelters in one form or another and the construction and location of these shelters is of paramount importance. Usually it is customary to provide several shelters in order to minimize possible loss in case of a direct hit with a large bomb. Most shelters are capable of sustaining hits by medium size bombs being constructed of reinforced concrete with an earth padding to absorb the primary shock.

Welding-Electrode Conservation Vital to the War Effort

By CLAYTON B. HERRICK
Welding Engineer, Lincoln Electric Co.

THE necessity of conserving materials in the war effort is nowhere more urgent than in the use of welding.

Welding is the key process which is making possible production of warships, military planes, tanks, and practically all other war equipment at the tremendous speeds which are vital to this country's speedy and complete victory.

In order that welding may contribute its utmost potentiality in war production, it is important that welding materials be utilized to maximum advantage. This applies particularly to welding electrodes.

The electrode for welding is probably the most essential piece of war-industry equipment today. It is the electrode which provides the metal of proper physical properties and operating characteristics permitting production of highest quality welds in minimum time and at minimum cost.

There are many factors which affect the most efficient use of electrodes. If conscientiously controlled, these factors will contribute to best use of welding in the war effort. The result will be a still faster rate of production by the use of welding and full utilization of the materials which welding-equipment manufacturers are producing at peak capacity.

The factors which have an important bearing on this situation follow:

1. *Select the right type of joint and be careful of fit-up.*—There is a type of joint (see Fig. 1), best suited to the particular job. A serious disadvantage in waste of weld metal results by using a complicated joint where the more simple type of connection will suffice. Since the type of joint greatly affects the amount of metal required, it is suggested that a study be made to make sure the joint is proper for the particular application. Obviously, the joint to select is the one which meets requirements at the greatest speed and the lowest cost.

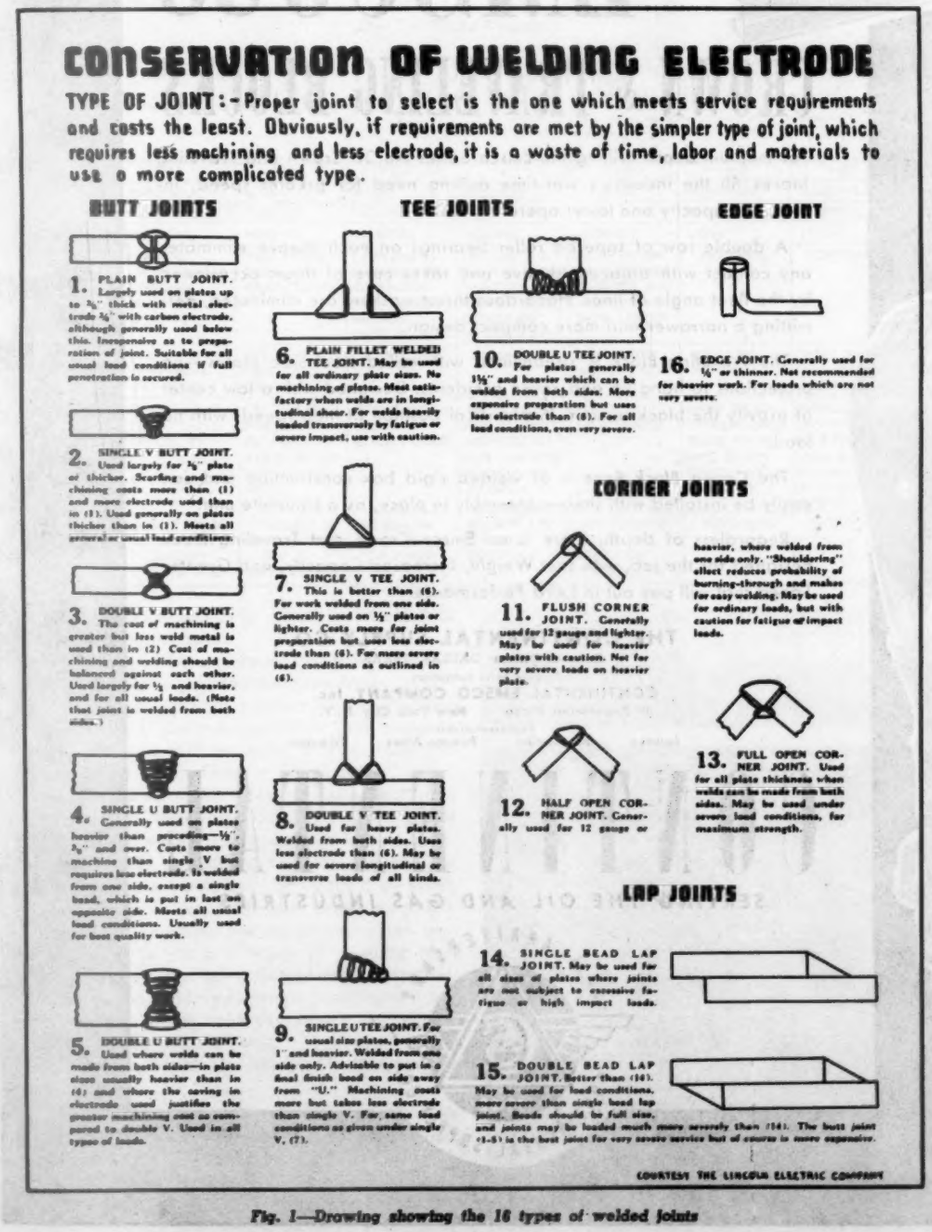

CONSERVATION OF WELDING ELECTRODE
TYPE OF JOINT:- Proper joint to select is the one which meets service requirements and costs the least. Obviously, if requirements are met by the simpler type of joint, which requires less machining and less electrode, it is a waste of time, labor and materials to use a more complicated type.
BUTT JOINTS
TEE JOINTS
EDGE JOINT
1. PLAIN BUTT JOINT. Largely used on plates up to 3/8" thick with metal electrode 3/16" with carbon electrode, although generally used below this. Inexpensive as to preparation of joint. Suitable for all usual load conditions if full penetration is secured.
2. SINGLE V BUTT JOINT. Used largely for 3/8" plate or thicker. Scarfing and machining costs more than (1) and more electrode used than in (1). Used generally on plates thicker than in (1). Meets all general or usual load conditions.
3. DOUBLE V BUTT JOINT. The cost of machining is greater but less weld metal is used than in (2). Cost of machining and welding should be balanced against each other. Used largely for 1/2 and heavier, and for all usual loads. (Note that joint is welded from both sides.)
4. SINGLE U BUTT JOINT. Generally used on plates heavier than preceding—1/2", 5/8" and over. Costs more to machine than single V but requires less electrode. Is welded from one side, except a single bead, which is put in last on opposite side. Meets all usual load conditions. Usually used for best quality work.
5. DOUBLE U BUTT JOINT. Used where welds can be made from both sides—in plate sizes usually heavier than in (4) and where the saving in electrode used justifies the greater machining cost as compared to double V. Used in all types of loads.
6. PLAIN FILLET WELDED TEE JOINT. May be used for all ordinary plate sizes. No machining of plates. Most satisfactory when welds are in longitudinal shear. For welds heavily loaded transversely by fatigue or severe impact, use with caution.
7. SINGLE V TEE JOINT. This is better than (6). For work welded from one side. Generally used on 1/2" plates or lighter. Costs more for joint preparation but uses less electrode than (6). For more severe load conditions as outlined in (6).
8. DOUBLE V TEE JOINT. Used for heavy plates. Welded from both sides. Uses less electrode than (6). May be used for severe longitudinal or transverse loads of all kinds.
9. SINGLE U TEE JOINT. For usual size plates, generally 1" and heavier. Welded from one side only. Advisable to put in a final finish bead on side away from "U." Machining costs more but takes less electrode than single V. For same load conditions as given under single V, (7).
10. DOUBLE U TEE JOINT. For plates generally 1 1/4" and heavier which can be welded from both sides. More expensive preparation but uses less electrode than (8). For all load conditions, even very severe.
16. EDGE JOINT. Generally used for 1/4" or thinner. Not recommended for heavier work. For loads which are not very severe.
CORNER JOINTS
11. FLUSH CORNER JOINT. Generally used for 12 gauge and lighter. May be used for heavier plates with caution. Not for very severe loads on heavier plate.
12. HALF OPEN CORNER JOINT. Generally used for 12 gauge or heavier, where welded from one side only. "Shouldering" effect reduces probability of burning-through and makes for easy welding. May be used for ordinary loads, but with caution for fatigue or impact loads.
13. FULL OPEN CORNER JOINT. Used for all plate thickness when welds can be made from both sides. May be used under severe load conditions, for maximum strength.
LAP JOINTS
14. SINGLE BEAD LAP JOINT. May be used for all sizes of plates where joints are not subject to excessive fatigue or high impact loads.
15. DOUBLE BEAD LAP JOINT. Better than (14). May be used for load conditions more severe than single bead lap joint. Beads should be full size, and joints may be loaded much more severely than (14). The butt joint (1-5) is the best joint for very severe service but of course is more expensive.
COURTESY THE LINCOLN ELECTRIC COMPANY

Fig. 1—Drawing showing the 16 types of welded joints

Use Proper Fit-Up

Joints and their fit-up should be given most careful consideration, as fit-up affects not only the cost of the welded joint as such, but also the performance of the finished product. As an illustration of the effect upon cost in a very simple fit-up, notice the case shown in Fig. 2, where there is shown a T-weld with ¼-in. plates. Assume that the cost of deposited metal is $1 per pound. Then if the joint is properly fitted up, the cost per foot of joint (two beads), would be $0.40. If, however, there is a gap between the vertical plate and the horizontal plate of $\frac{1}{16}$ in., the cost is increased to $0.58 per foot. If this discrepancy is ⅛ in., the cost is increased to $0.80 per foot, resulting in a difference of $0.18 to $0.40 for $\frac{1}{16}$-in. and ⅛-in., respectively. Obviously, money spent in obtaining good fit-up is readily saved in welding.

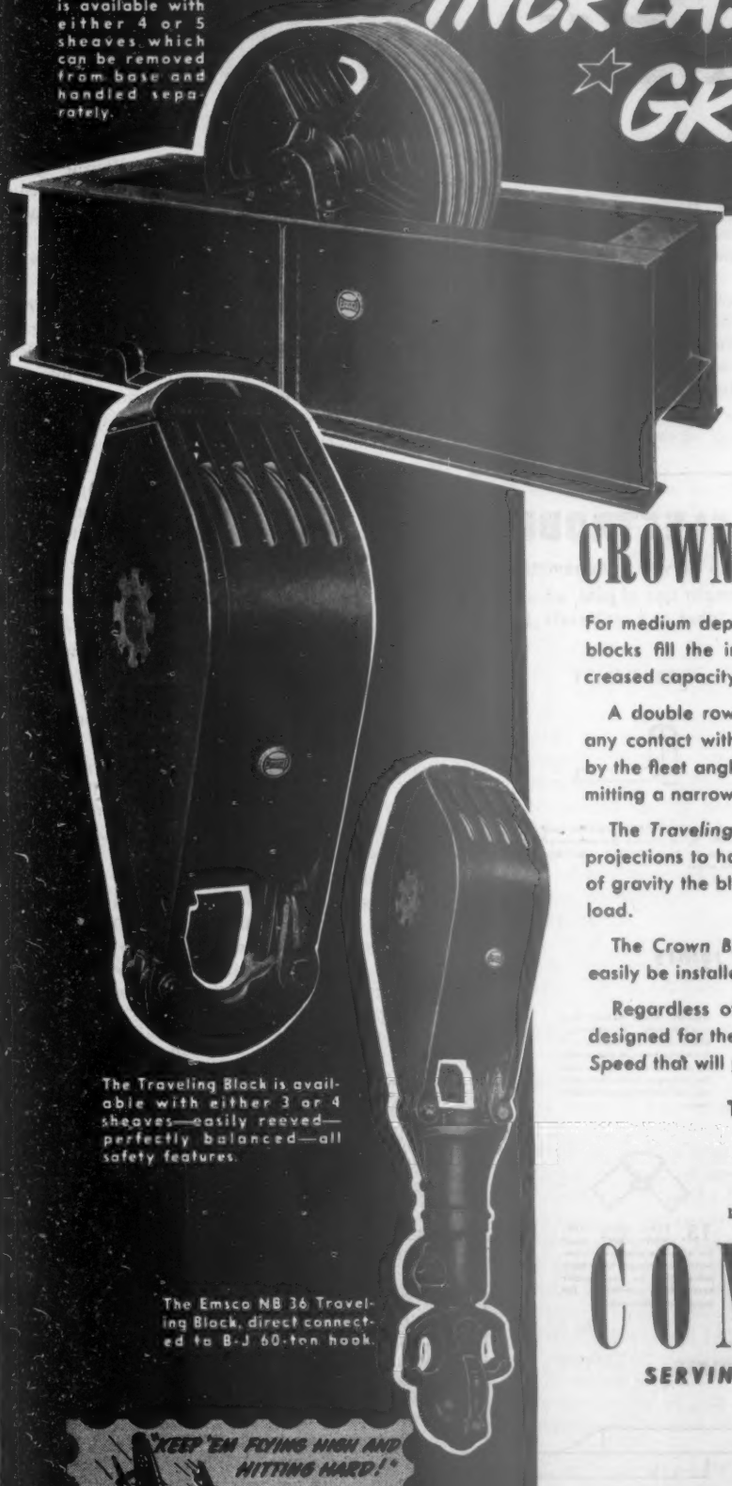
Lb./ft. of joint	$0.40	$0.58	$0.80
Cost/ft.	0.40	0.58	0.80
Increase in cost		0.18	0.40

2. *Choose the correct type of electrode.*—While the general-purpose electrode will produce satisfactory welds under virtually every condition, special electrodes as for example heavily coated fast-flowing types would prove more efficient. The electrode should be chosen with respect to: (*a*) physical properties required; (*b*) type of joint; (*c*) position of welding, that is, flat, vertical, overhead, or horizontal; and (*d*), condition of fit-up of the work. Recommendations of the equipment manufacturer should be considered.

3. *Use an electrode which has and maintains a uniform coating.*—The electrode coating, if not correct, will cause rejects not only of the electrodes themselves but possibly of the welds produced by their use. It should be remembered that the coating not only produces the protecting shield but it also controls: (1) fluidity of the metal; (2) penetration; (3) shape of the beads; (4) physical properties of the deposit; and (5) composition of the deposit.

4. *Use electrodes which provide proper physical properties.*—Electrodes manufactured today are clearly described by the manufacturer in respect to the quality of weld they will produce. Required physical properties of the work at hand should

☆LESS WEIGHT
☆INCREASED CAPACITY
☆GREATER SPEED



The Crown Block is available with either 4 or 5 sheaves which can be removed from base and handled separately.

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The Emsco NB 36 Traveling Block, direct connected to B-J 60-ton hook.

EMSCO NB 36

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A double row of tapered roller bearings on each sheave eliminates any contact with adjacent sheave and takes care of thrust occasioned by the fleet angle of lines. Hazardous thrust washers are eliminated, permitting a narrower and more compact design.

The *Traveling Block* is streamlined with rolled steel side plates—no projections to hang up and cause accidents. Designed with a low center of gravity the block remains in a vertical position at high speeds with no load.

The *Crown Block Base* is of welded rigid box construction and can easily be installed with sheave assembly in place, as a complete unit.

Regardless of depth, there is an Emsco Crown and Traveling Block designed for the job, with *Less Weight, Increased Capacity,* and *Greater Speed* that will pay out in *Extra Performance.*

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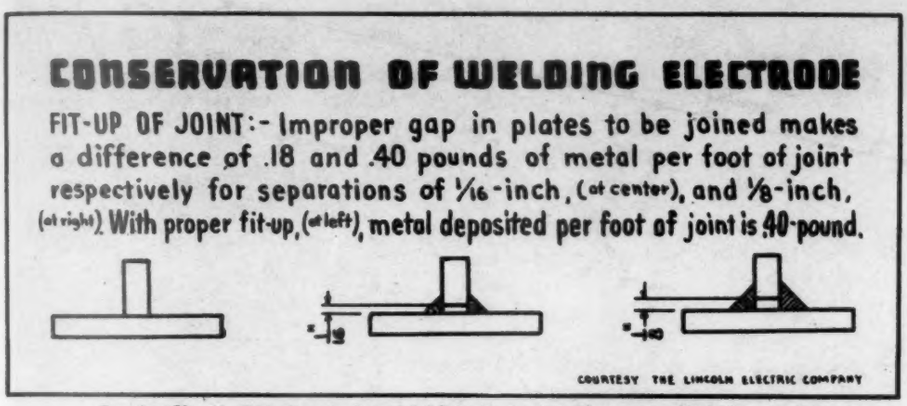

CONSERVATION OF WELDING ELECTRODE
FIT-UP OF JOINT:- Improper gap in plates to be joined makes a difference of .18 and .40 pounds of metal per foot of joint respectively for separations of 1/16-inch, (at center), and 1/8-inch, (at right). With proper fit-up, (at left), metal deposited per foot of joint is .40-pound.
COURTESY THE LINCOLN ELECTRIC COMPANY

Fig. 2—(Above): Variations in fit-up of joints affects electrode consumption to large extent

TABLE 1—SHOWING EFFECT OF ELECTRODE SIZE ON WELDING ECONOMY

Effect of Changing Electrode Size

Electrode Size	1/8	5/32	3/16	1/4	5/16	3/8
Amperes	110	130	150	250	325	425
Arc Volts	24	25	26	30	34	38
K.W. at Arc	2.64	3.25	3.9	7.5	11.1	16.1
Consumption Rate, lbs. per hour	2.6	3.3	3.95	7.5	10.7	16.2
Deposit, lbs. per hr. (50% operating factor)	0.87	1.1	1.32	2.5	3.57	5.4
Efficiency of Set (%)	47	50	51	55	59	59
Kilowatt Input	5.6	6.5	7.65	13.65	18.8	27.3
Interruptions per lb. Consumed	18	12	8	5	3	2

Cost Per Pound Deposited

Labor	$1.150	$0.909	$0.758	$0.400	$0.280	$0.185
Overhead	1.150	.909	.758	.400	.280	.185
Power	.064	.059	.058	.055	.053	.051
Electrode	.150	.135	.127	.127	.127	.127
Cost of Interruption (including overhead)	.050	.033	.022	.014	.008	.005
	$2.564	$2.045	$1.723	$0.996	$0.748	$0.553

	"F"	"A"	"B"	"C"	"D"	"E"	"G"
ARC CURRENT	NORMAL	LOW	HIGH	NORMAL	NORMAL	NORMAL	NORMAL
ARC VOLTS	NORMAL	NORMAL	NORMAL	LOW	HIGH	NORMAL	NORMAL
ARC SPEED	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	LOW	HIGH
BURN OFF OF ELECTRODE	NORMAL APPEARANCE COATING BURNS EVENLY	PRACTICALLY SAME AS PRECEDING	COATING IS CONSUMED AT IRREGULAR HIGH RATE-WATCH CAREFULLY	COATING TOO CLOSE TO CRATER TOUCHES MOLTEN METAL RESULTING IN POROSITY	DROPS AT END OF ELECTRODE FLUTTER AND THEN DROP INTO CRATER	NORMAL	NORMAL
PENETRATION FUSION (CRATER)	FAIRLY DEEP AND WELL DEFINED	NOT VERY DEEP NOR WELL DEFINED	DEEP, LONG CRATER	SMALL	WIDE AND RATHER DEEP	CRATER NORMAL	SMALL, RATHER WELL-DEFINED CRATER
APPEARANCE OF BEAD	EXCELLENT FUSION-NO OVERLAP	ON TOP OF PLATE, NOT AS MUCH OVERLAP AS WITH BARE ROD.	BROAD, THIN BEAD-GOOD FUSION	HIGH BEAD NOT AS PRONOUNCED AS FOR LOW AMPS. SOMEWHAT BROADER	WIDE SPATTERED	WIDE BEAD-OVERLAP LARGE BASE METAL AND BEAD. EXCESSIVELY HEATED	SMALL BEAD-UNDERCUT-REDUCTION IN BEAD SIZE AND UNDER CUTTING DEPENDS ON SPEED AND AMPERES
ARC SOUND	SPUTTERING HISS PLUS SHARP CRACKLING	IRREGULAR SPUTTERING, SOME CRACKLING	REGULAR EXPLOSIVE SOUNDS	HISS PLUS STEADY SPUTTER	SOFT SOUND PLUS HISS AND FEW CRACKLES	NORMAL	NORMAL

Fig. 3—(Left): Table of weld characteristics made with proper and improper procedure

be known and the electrode should be selected to meet these requirements.

5. *Use fast-flowing electrodes wherever possible.* Certain electrodes are manufactured today to permit the fastest possible welding under specified conditions. It is obvious, therefore, that electrode and, hence, time will be saved if these fast-flowing types are used wherever practical.

6. *Select an electrode which keeps splatter and slag loss at a minimum.*—Since all splatter is a waste of weld metal, the importance of this is obvious. It should be realized that the splatter loss of the electrodes varies and care should be taken to avoid use of those which have excessive losses.

7. *Wherever possible use electrodes which produce flat beads.*—It is a waste of welding electrode to deposit any more metal than is required. Not only is the welding electrode itself wasted but useless time is required to remove the excess metal from the welded joint.

8. *Select the right size electrode.*—The largest diameter electrode which can be used effectively is the best from the standpoint of electrode conservation. The saving runs up to 40 per cent per pound deposited, for example, when ¼-in. is used instead of 5/32-in. (see Table 1).

9. *Use long electrodes in the larger size.*—The obvious results is the reduction in the number of stub ends and in the time saved by eliminating interruptions to change rods.

10. *Do not bend electrodes.*—This generally unnecessary habit will waste from one-fourth to one-third of the electrode. Use electrodes straight and get the maximum of deposited weld metal from each rod.

11. *Use proper voltage and current settings.*—Every electrode manufactured is designed to operate at a certain voltage and within a specified current range. If current is too high or too low, it will manifest itself either in excessive splatter loss or inferior welds.

12. *Follow the procedure specified for the electrode.*—Accompanying each different electrode manufactured are detailed specifications regarding procedures to be followed. These specifications have been prepared carefully by the electrode manufacturer and, if followed consistently, will prevent waste of electrode and assure high-quality welding.

13. *Avoid using an excessive number of beads.*—If one bead of weld metal will meet designed requirements, it is obviously a waste of electrode to add additional beads. This same applies to applications where two beads suffice.

14. *Use electrode down to minimum stub end.*—Remember that the electrode can be used the entire length of its coated surface. Leaving any more than a minimum stub end is an obvious waste. Just ½-in. difference in stub end saves 3½ per cent on an 18-in. length rod.

15. *Collect and save stub ends of electrode.*—At the rate in which welding is being used today in war production, the amount of metal which would be wasted by failure to save stub ends would be tremendous.

16. *Use modern high-capacity welding generator.*—Welding generators manufactured today have much higher capacity and much greater efficiency. For example, a modern 40-volt generator was shown to produce 7.7 in. of joint per electrode as against 6.6 in. for an older machine.

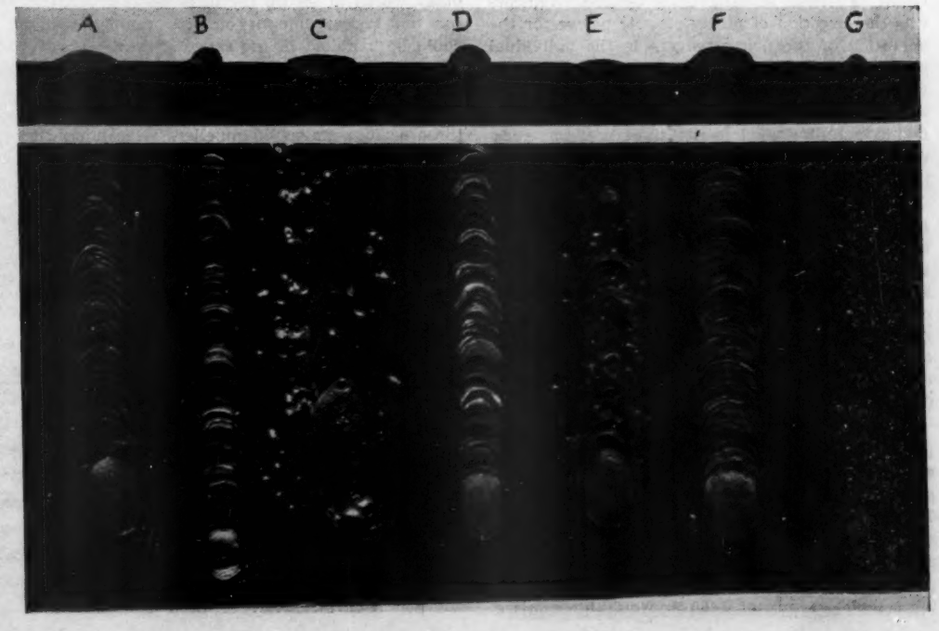
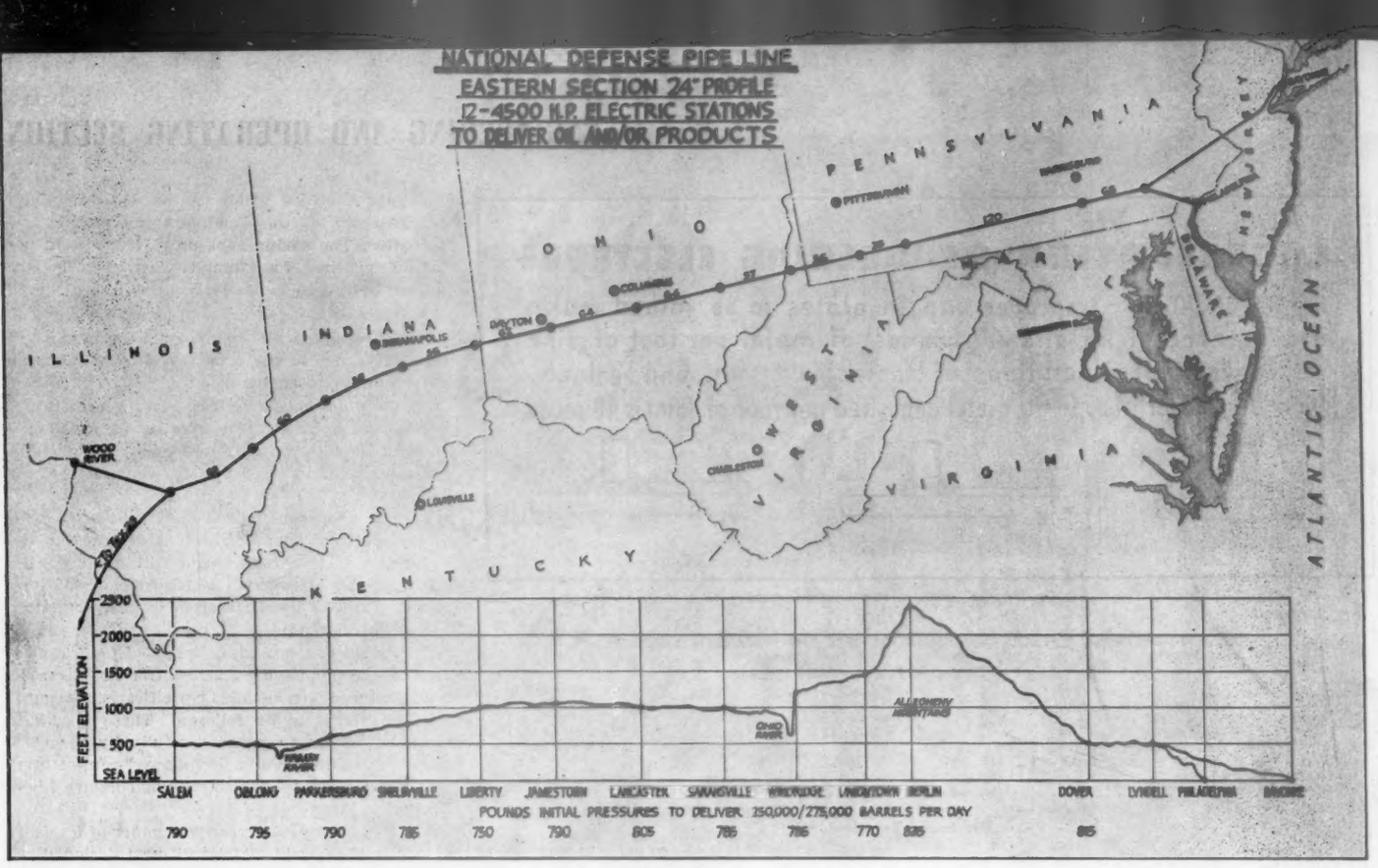


Fig. 4—(Right): Plain and elevation views of welds made with shielded arc under various conditions. (A) current, voltage, and speed normal; (B) current too low; (C) current too high; (D) voltage too low; (E) voltage too high; (F) speed too low; (G) speed too high



Eastern section of pipe line showing route, stations and vertical plan. Elevation varies from 400 ft. at the Wabash River to 2,400 ft. in the Appalachian Mountains

Defense Line Station Design

By W. H. STUEVE
Oklahoma Gas & Electric Co., Oklahoma City, Okla.

THE possibility of the necessity of installing a transcontinental pipe line from the oil fields of the Southwest to New Jersey tidewater is again being given serious consideration by the authorities in Washington. The question of its necessity has been subject to a great deal of controversy, but in the light of recent events in the Atlantic and Caribbean there is some possibility of its revival.

As is generally known, aerial surveys for the proposed line were actually conducted, pumps were designed and preliminary analyses were prepared by the design engineers to select the motive power in the pump stations. The outstanding result of these investigations by the engineers was the selection of utility electric power for the operation of the prime movers in the individual pump stations. The design committee of engineers were given a problem to solve and they were interested only in the selection of the most economic pumping equipment; therefore, the question of its advisability or the economic merit of its installation was left entirely to others.

The volume of the proposed national-defense pipe line at that time was predicated on the desired delivery of an amount of oil and/or products equivalent to the normal delivery of fifty or sixty 100,000-bbl. tankers turned over to Britain, ordinarily requiring about 20 days for a round-trip voyage from Gulf refineries or crude-loading docks to New Jersey ports, such delivery volume estimated to be the equivalent of 250,000 to 275,000 bbl. per day.

Capacities of this order required equivalent pipe-line diameters of 22 to 24 in. to be considered since working pressures were limited to about 800 lb. at each station by the pipe mills. The velocity of the liquid stream was of the order of 5.5 to 6.5 ft. per second. Referring to the map and profile of the proposed line, the initial station pressures are shown beneath each station, indicating a total pressure of 9,495 lb. would be required to pump the desired capacity through 760 miles of pipe line, or an average of 791 lb. per station.

Some consideration was given to installing two parallel pipes or a twin 16-in. or 18-in. line, feeling that a single pipe lacked the flexibility in operation due to various types of oil or products required to be pumped. Another disadvantage of the single large pipe was the hazard of maintaining sufficient oil reserves to keep it operating at full capacity. Apparently the decision for the single large pipe was based on the saving of steel, or in other words to secure the most barrels delivered for the lowest amount of pipe tonnage which could be installed in the shortest time.

In the design of the pumps, difficult problems were encountered in attempting to adhere to the conventional pattern of pipe-line pumps, wherein three or four stages of impellers were housed in one casing, each stage capable of generating 250 to 300 ft. of head. In this case of the national-defense pipe line, consideration had to be given to passing 7,500 to 8,000 g.p.m., through short curved tubes from one stage to another in the same casing to secure a balanced thrust on the impeller shaft to avoid too great a loss in friction and also to avoid cavitation in the first stages, thereby greatly reducing the efficiency of the pump. These difficulties were overcome by the pump manufacturers by offering three single-stage pumps, each capable of developing 700 to 750 ft. of head, or one-third the total initial pressure, all three units to be operated in series for the maximum capacity desired. This scheme of design enabled the pump manufacturer to guarantee about 88 per cent efficiency with water or 86 per cent efficiency at 3,550 r.p.m., when pumping crude of about 35° B. gravity and 50 to 60 S. S. U. viscosity. The electric-motor manufacturers were able to guarantee 95.4 per cent efficiency of their standard duct ventilated 3,550-r.p.m., two-pole induction motor in the needed size of 1,500 hp. Thus, the over-all efficiency of the combined pump and motor could be considered at 82 per cent, which is perhaps 5 to 10 per cent greater than could have been obtained with the required number of impellers housed in one casing.

The larger diameter pipe of 24 in. was to be installed from a point in South Central Illinois to Lyndell station, a distance of approximately 760 miles. The pressure drop per mile was of the order of 12.5 lb. per sq. in. when pumping crude of 50 to 60 S. S. U. viscosity, requiring that the stations be spaced on an average of 56 to 64 miles apart in the level portion of the line. A total of 12 stations were required with a computed electric input load of 3,100 kw. per station, or a loading on each motor of 88 per cent of its full rated shaft horsepower.

Thus, the electric energy required to pump 1 bbl. of oil or oil products will be 0.52 kw.-hr. per 100 miles, or about 4 kw.-hr. are needed to make delivery of 1 bbl. from Illinois to eastern tidewater. Ordinarily a figure of 0.75 to 1 kw.-hr. per barrel per 100 miles is not considered excessive for conventional installations of long pipe lines using sizes from 12-in. to 8-in. in diameter and velocities attained of the order of 5 to 6 ft. per second.

The power factor achieved in the design of large 1,500-hp. two-pole motor operating at near full rated shaft load is 91.5 per cent, which means that the ratio of electric volt-ampere of supply will be only 8.5 per cent greater than the delivered shaft output of the motor expressed in work done or watts.

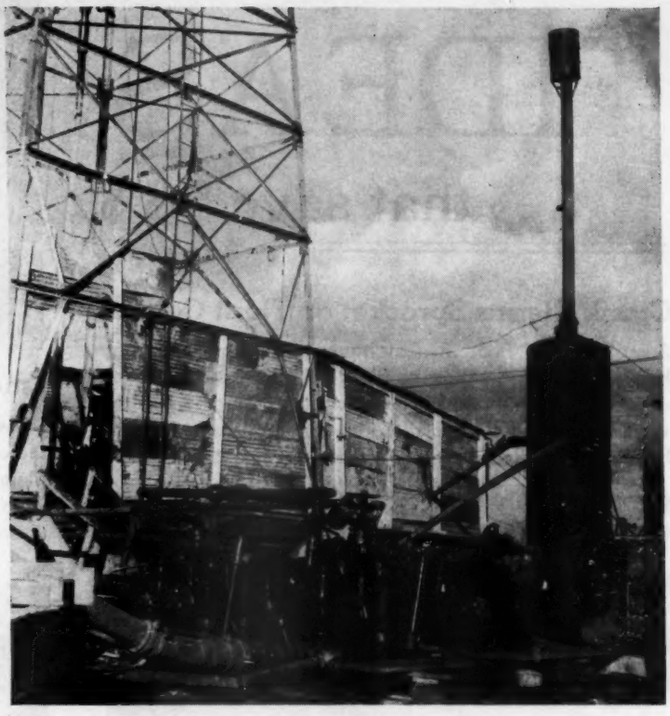
Transforming substations required at each of the pump stations, therefore, could be of 3,400 k.v.a. capacity (3,100 kw. -:- 0.915 pf), but in operating practice these substations would be fitted with three 1,500-k.v.a. standard rating transform-

(Continued on Page 53)

Operating Ideas

Handy Rack For Spare Lines

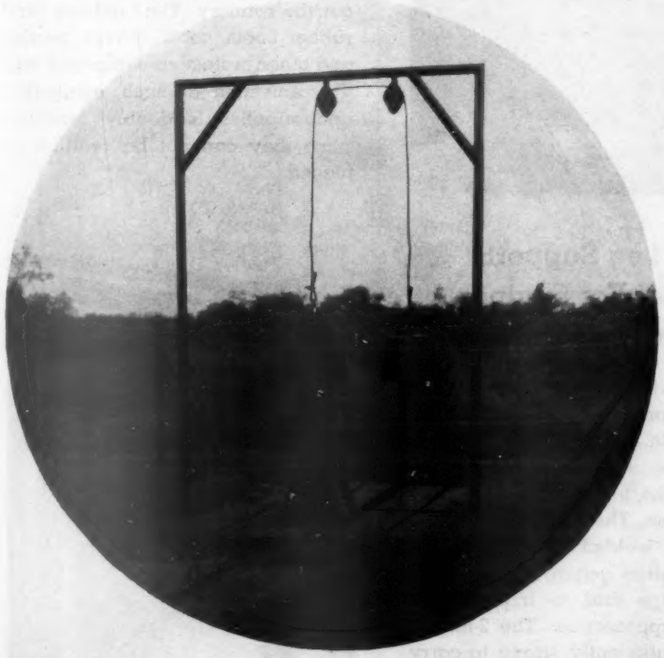
A rack, on which spare ropes, light lines or chain can be hung out of the way but instantly available when wanted, has been provided by a Texas Gulf Coast drilling contractor for use on all his rigs. It is a simple frame, consisting of a transverse pipe welded on top of two supporting legs, and on which is welded a row of hooks for hanging the ropes and lines. Placed at the back of the drilling engine, it also serves as a guard across an open end of the engine floor. It is readily removable by lifting the supporting posts from sockets in floor framing in which it normally rests. Each of the legs has a steel plate on the bottom so they can be bolted to the floor.



Oil Drum Silences Steam Exhaust

In townsite drilling, operators have been faced with the necessity of silencing engine and pump exhaust, and many different means have been devised for doing this. A particularly effective silencer was improvised by a Texas operator by use of an old oil drum. The steam, in this case, is discharged first into an old separator, having a 10 to 12-ft. riser out of the top. The oil drum is mounted on top the riser by means of welded braces.

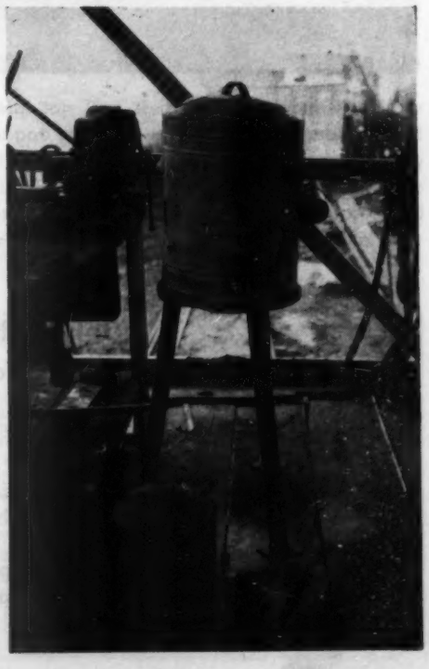
Counter-Balance Lifts Trap Top



Moisture traps on high-pressure gas lines in the K.M.A. field, Wichita County, Texas, rise several feet above the surface level and are equipped with flanged heads, each weighing 80 lb. To facilitate removal and replacement of the heads by one man, each is equipped with a counter-balance, consisting of an equalizing weight with a line strung through two overhead pulleys to the trap top. After unbolting the flanges which fasten the top on the trap, the top can be raised or lowered with practically no effort. The frame supporting the two pulleys is fabricated from sections of 2-in. pipe, and consists of two supporting legs and a transverse pipe welded across the top and braced.

Stand For Water Cooler

A three-legged stand for the water cooler on the rig floor is made from three short lengths of 2-in. pipe, one end of each terminating in a square plate to give proper footing, the other end being welded to a circular plate slightly larger in diameter than the base of the water cooler used. Around the rim of the circular top are welded short sections of plate, curved to fit the cooler, forming retainers to prevent the cooler from being displaced by vibration of the rig.



Refinery IDEAS

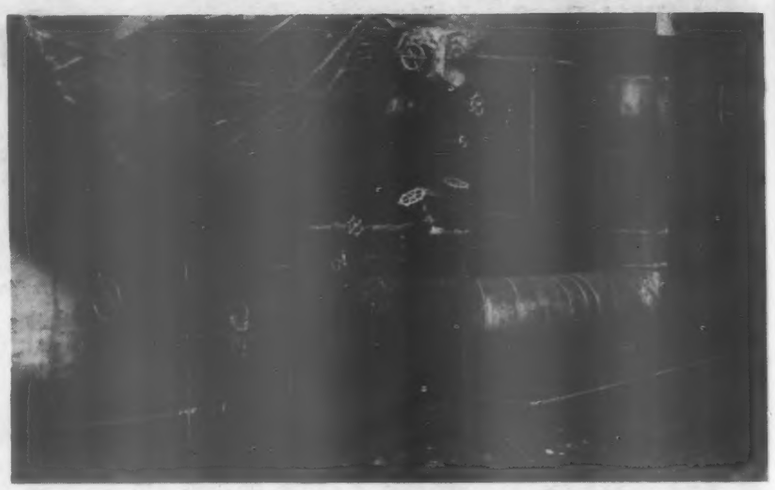
. . . that save $ $ $

Crank Cleans Sprocket on Float Control

Sometimes the float in a high-pressure surge tank may become stuck. This may be due to accumulations of wax or ice on the chain which prevents it from moving on the sprocket. In order to correct this condition here a crank has been installed on the sprocket hub. The crank is normally disengaged so that it will not interfere with the float action. When used, the crank is engaged, as shown, and the sprocket is worked back and forth until the accumulations on the chain are knocked off and it is free to operate. A routine of twice daily turning the crank will keep the assembly in satisfactory working order.

Rubber Plug For Testing Valves

This tool consists simply of a hammer handle with a rubber cone affixed to the head. It is used to plug the end of a tube while compressed air is introduced into the opposite end for testing. The plug is held in place during the testing.



Emergency Valves Painted a Bright Color

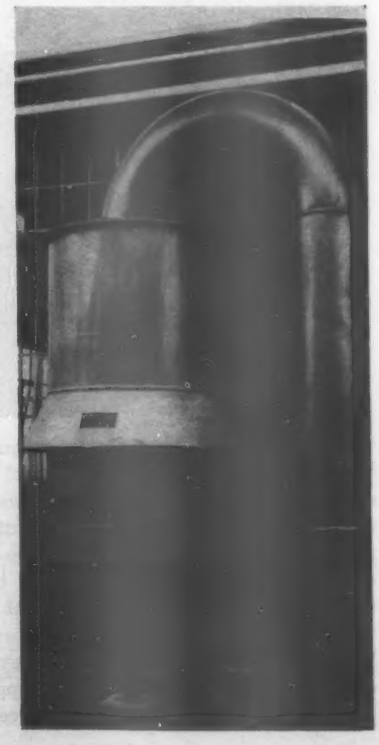
Some of the valves shown in this picture are painted a bright orange while the others are a dark color. In the event of an emergency requiring a complete shutdown, the orange-colored valves are closed. By distinguishing them in this manner any operator, even one entirely unfamiliar with the unit, will know which valves to close.

Safety First Cabinets

Fully equipped, all-metal, safety-first cabinets of the type shown here are installed at a number of readily accessible points throughout the refinery. The cabinets hold rubber boots, coats, gloves, masks, and other protective equipment and the protection of such equipment and supplies is doubly essential since they can not be readily replaced.

Single Leg Supports Oil Filter For Engine

Ample and attractive supports are provided at one plant for the air filter serving each of the 600-hp. compressors by partially imbedding a 2-in. vertical pipe in a concrete base and welding a pipe cross at the top to provide a horizontal base. The ends of the cross arms are welded closed to eliminate moisture getting to the inside of the pipe and to improve the general appearance. The 2-in. upright is sufficiently strong to carry the load yet flexible enough to take side thrusts and avoid a strain on the filter body. The crossarms of the pipe support may be grooved to take the rim of the filter or slight projections upward can be left when welding closes each end of the four arms. This will allow the filter to set down snugly inside these projections but not hold it rigidly.



CO$T Engineering

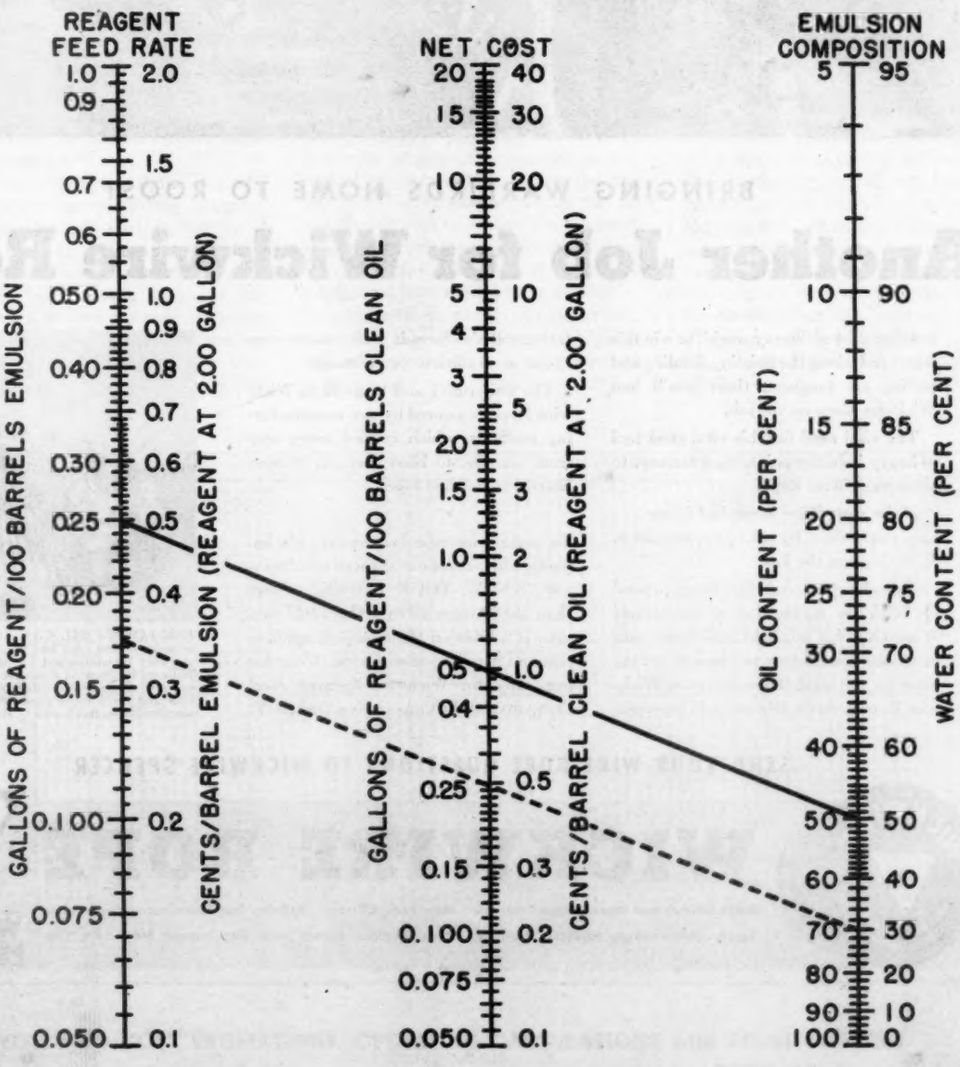
REAGENT FEED RATE—EMULSION COMPOSITION—NET COST RELATION

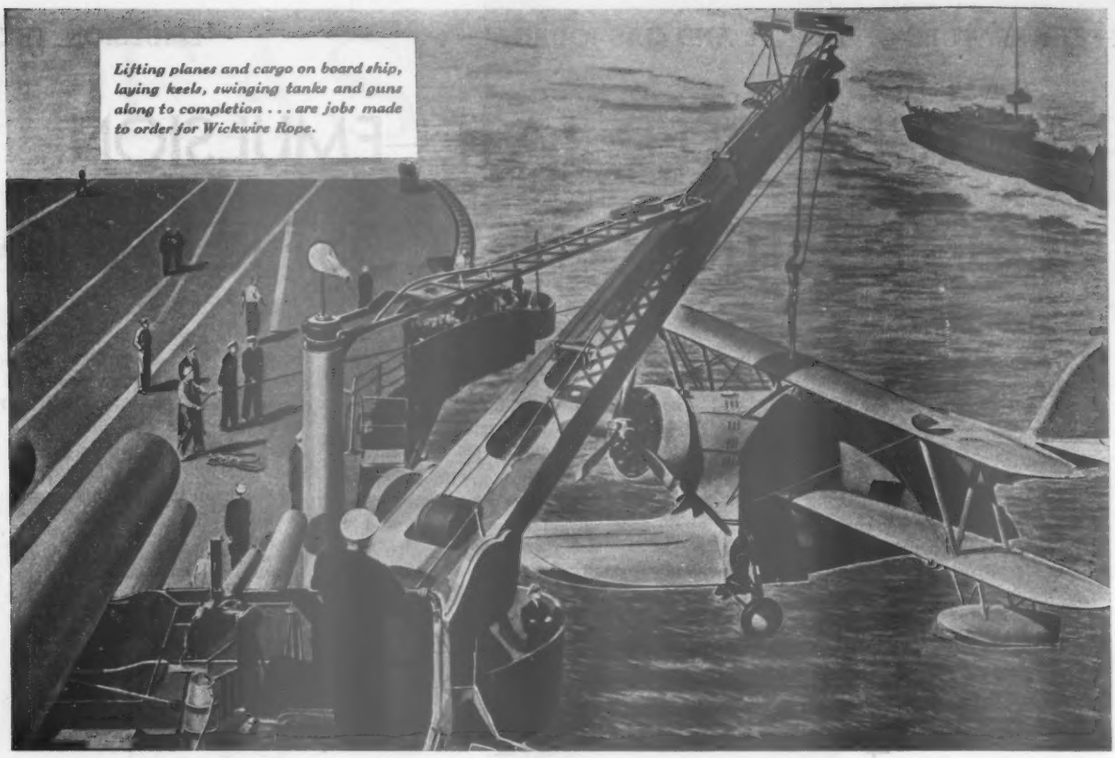
THE accompanying scales are useful in determining the real or net cost of chemical reagents for recovering clean oil from emulsions.

Example 1 (solid line): An emulsion cuts 50 per cent water, the reagent feed rate is ¼ gal. per 100 bbl. of emulsion and costs $2 per gallon. What is the net cost for chemical reagent per barrel of clean oil recovered? From the point "0.25," on the "gallons" side of the left-hand scale, lay a straightedge to the point "50," on the "water" side of the right-hand scale. The net cost (from the center scale) is therefore 1.0 cent per barrel. since 0.5 gal. of reagent is required to recover 100 bbl. of clean oil.

Example 2 (broken line): What rate of chemical feed will be required on an emulsion 70 per cent oil and 30 per cent water, for a net chemical cost of 0.5 cent per barrel, when cost of reagent is $2 per gallon A line from "70" on the "oil" side of the right-hand scale to "0.5" on the "cents" side of the center scale, will cross the left-hand scale at "0.175" on the "gallons" side and "0.35" on the "cents" side. Reagent must be fed at rate of 0.175 gal. per 100 bbl. (0.35 cent per bbl.) of emulsion to meet this requirement.

Submitted by Louis T. Monson, Tretolite Co. of California. Large reproductions of these scales, may be obtained without obligation by addressing the author, Louis T. Monson and company at 5515 Telegraph Road, Los Angeles, Calif.


REAGENT FEED RATE
GALLONS OF REAGENT/100 BARRELS EMULSION
CENTS/BARREL EMULSION (REAGENT AT 2.00 GALLON)
NET COST
GALLONS OF REAGENT/100 BARRELS CLEAN OIL
CENTS/BARREL CLEAN OIL (REAGENT AT 2.00 GALLON)
EMULSION COMPOSITION
OIL CONTENT (PER CENT)
WATER CONTENT (PER CENT)



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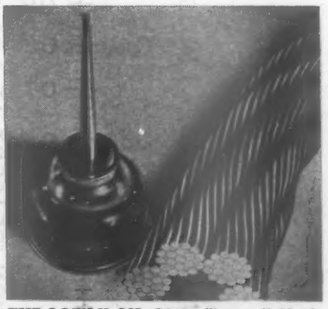

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CO$T Engineering

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

DETERMINING COST PER FOOT OF BIT SERVICE

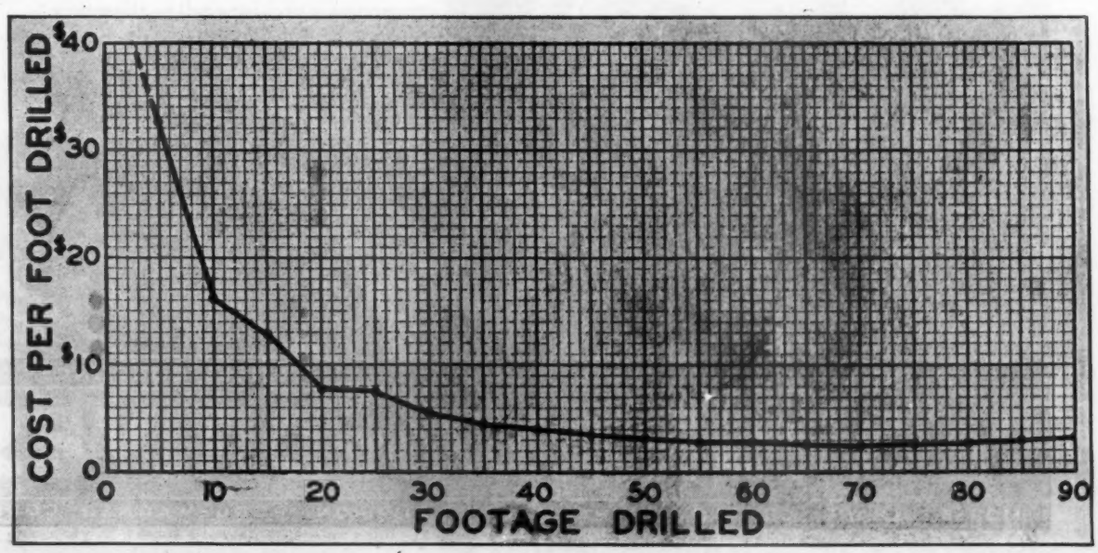
THE use of drilling-time data as a means of determining when to change the bit has often been suggested. Such a determination must depend on the fact that the penetration rate decreases as the bit wears. The reliability of this consideration requires that the formation be uniform and that the drilling control remain unchanged. Since uniformity is not found through any considerable thickness, exact determination of the proper time for renewal is not possible. However, it has been found that attempts to evaluate bit performance have resulted in improvements over existing practice.

In the accompanying figure a method is shown for recording progressively the cost per foot drilled by a bit. The interval chosen here was 5 ft., but any convenient interval could have been used. Each time the bit progresses 5 ft. the average cost per foot for the total footage made by that bit is plotted on the chart. Cost of the first 5 ft. drilled includes the entire cost of the bit, the rig time spent in running the bit to bottom, and the drilling time which was required to make the 5 ft. of hole. As more footage is made, the bit and trip costs are divided over a larger number of feet drilled, so that the drilling cost per foot decreases rapidly, other conditions being equal. Then comes the time when the bit becomes so worn that the rate of progress is insufficient to maintain the established minimum cost per foot, and the per-foot cost begins to rise because of the excessive expenditure of rig time per foot of progress. Unless there has been a noticeable change in formation characteristics, this is the signal that the economic life of the bit has passed and it is time for renewal. If a rate-of-penetration recorder is in use, formation changes will usually be recognized by rather sharp breaks.

Because it is never altogether certain that a gradual formation change has not occurred, it is necessary to continue the use of the worn bit until a definite upward trend in cost per foot is established on the chart. Usually the plotting of two points after the economic limit is reached will be sufficient to indicate the upward trend. In the example shown, the bit reached its economic limit after 70 ft. of drilling, and should have been removed at 80 ft.

Value of rig time is used as a constant in plotting the points on the chart. This figure varies for the various-sized rigs, but $10 per hour represents a fair average figure.

Drillers are usually quite competent in judging bit wear, but the number of "green" bits pulled is evidence that their judgment is not infallible. The compilation of charts of the accompanying type gives them an excellent opportunity to check and modify their judgment. It is interesting to note that a chart of this type can be used for determining the economic life of almost any item of equipment, including sucker rods, automobiles, and trucks.



DEVOTED TO COST ESTIMATIONS, OPERATING CALCULATIONS AND PROFIT MAKING

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Engineering Fundamentals

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL No. 1

UNITS OF MEASUREMENTS USED BY THE PRODUCTION ENGINEER

By GLENN M. STEARNS
Associate Professor, Petroleum Engineering, University of Oklahoma

IT is unfortunate that the English system of units is usually the basis for quantitative measurement in the oil-field work of this country. In this system there are a great many different units for measuring the same thing. Use of the metric system, especially in laboratory work, further complicates our system of units.

Listed in Table 1 are several units of weights and measures which are used in connection with drilling and production work. The ability to recall or repeat any part of this table from memory is a great asset to anyone who intends to deal with any problem in which such weights or measures are involved. Such knowledge is much better than depending upon reference to a book or conversion table, since such a book or table is not always available when needed.

It will be noted that Table 1 does not contain, by any means, all of the units encountered in the field of production engineering, but it either contains all of the commonly used units or else furnishes a basis from which they can be calculated.

In order to obtain equalities for areas similar to those given in the table for lengths, all that is necessary is to square both sides of the equations we already have. Some examples follow:

(1) 1 in. = 2.54 cm. (Table 1)

Square both sides and we have

1 sq. in. = 6.45 sq. cm.

(2) 1 ft. = 12 in. (Table 1)

Or square both sides and we have

1 sq. ft. = 144 sq. in.

(3) 1 mile = 5,280 ft. (Table 1)
1 rod = 16.5 ft. (Table 1)

Then 1 mile = (5,280/16.5) rods = 320 rods.

1 sq. mile = 1 section = $(5,280/16.5)^2$ sq. rods.

Or 1 section = 102,400 sq. rods.

In order to obtain equalities for volumes based on the table of lengths, it is only necessary to cube both sides of the length equations as illustrated in the following examples:

(4) 1 ft. = 12 in. (Table 1)
1 cu. ft. = $(12)^3$ cu. in. = 1,728 cu. in.

(5) 1 yd. = 3 ft. (Table 1)
1 cu. yd. = $(3)^3$ cu. ft. = 27 cu. ft.

(6) 1 in. = 2.54 cm. (Table 1)
1 cu. in. = $(2.54)^3$ cu. cm. = 16.39 cu. cm.

The examples given above are very simple, but illustrate clearly the fact that units of area represent $(\text{length})^2$ and units of volume represent $(\text{length})^3$. Remembering this fact will enable one to considerably reduce the number of conversion factors that he must burden his memory with in order to use such units at any and all times. Most of the other units which may be encountered are derived by calculation from those included in Table 1. Examples of calculation of some of these additional units are given below:

(7) To find the number of gallons in a cubic foot.
1 ft. = 12 in. (Table 1)
1 cu. ft. = 1,728 cu. in. (Example 4)
1 gal. = 231 cu. in. (Table 1)
Then
1 cu. ft. = 1,728/231 gal. = 7.48 gal.

(8) To find the number of cubic feet in a barrel:
1 cu. ft. = 7.48 gal. (Example 7)
1 bbl. = 42 gal. (Table 1)
Then
1 bbl. = 42/7.48 cu. ft. = 5.61 cu. ft.

(9) To find the volume in barrels of 1 acre-foot. (By definition 1 acre-foot is the volume of a slab 1 acre in area and 1 ft. in thickness.)
1 acre = 43,560 sq. ft. (Table 1)
Then
1 acre-ft. = 43,560 cu. ft.
1 bbl. = 5.61 cu. ft. (Example 8)
Then
1 acre-ft. = 43,560/5.61 bbl. = 7,765 bbl.

(10) To convert from cubic feet per minute to barrels per day.
1 bbl. = 5.61 cu. ft. (Example 8)
Divide both sides by 5.61, and
1 cu. ft. = 1/5.61 bbl.
Then
1 cu. ft. per minute = 1/5.61 bbl. per minute.
1 day = 1,440 minutes.
Then
1 cu. ft. per minute = 1/5.61 × 1,440 bbl. per day = 256.7 bbl. per day.

There are too many combinations of units used in production and drilling problems to mention all of them separately. By memorizing the material given in Table 1, and following methods of calculation similar to those illustrated in the examples above, one should be able to handle unit conversions ordinarily encountered in everyday production engineering problems. A considerable number of problems in later parts of this series will illustrate the use of many additional units that have not been mentioned in this instalment.

TABLE 1

Everyday Units of Measurement for Oil-Field Use

Length.
1 in. = 2.54 cm.
1 ft. = 12 in.
1 m. = 100 cm. = 1,000 mm.
1 yd. = 3 ft.
1 rod = 16.5 ft.
1 mile = 5,280 ft.

Area.
1 acre = 43,560 sq. ft.
1 section = 1 sq. mile = 640 acres.

Volume.
1 gal. = 231 cu. in. = 4 qt.
1 bbl. = 42 gal.
1 l. = 1,000 cu. cm.

Pressure.
1 standard atmosphere = 34 ft. of water = 30 in. of mercury = 14.7 lb. per sq. in.

Weight.
1 kg. = 1,000 g.
1 lb. = 454 g. = 16 oz.
1 ton (short) = 2,000 lb. (long ton seldom used).
1 gal. of water = 8.34 lb.

Power.
1 hp. = 33,000 ft.lb. per minute = 0.746 kw.

Engineering Fundamentals

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL No. 2

PRESSURE RELATIONSHIPS—PART 1

By GLENN M. STEARNS
Associate Professor, Petroleum Engineering, University of Oklahoma

SOME of the most elementary facts concerning liquid pressures in general and illustrations with certain simple cases that may apply directly to oil production problems are presented.

In Fig. 1 is represented two water containers, each of which is 10 ft. high and brimful of water. The base of container *A* is 1 ft. square and is thus 1 sq. ft. in area. The base of container *B* is 2 ft. square and is thus 4 sq. ft. in area. The pressure on the bottom of container *A* due to water in the container is the same as the pressure on the base of container *B*, but the force exerted on the base of container *B* by the water is four times the force exerted on the base of container *A*. In other words, the term pressure is used to designate force exerted on a unit area. It is well to remember from this illustration that the amount of pressure exerted by a column of a given liquid depends only on the height of that liquid and is not affected by the cross-sectional area upon which it acts.

Considering Fig. 1 further, we will calculate the pressure exerted by the water in either container. Water weighs 62.4 lb. per cu. ft. In either container there are 10 cu. ft. of water supported on each square foot of area at the base. Then the pressure on the base of either container is $P = 10 \times 62.4$, or 624 lb. per sq. ft.

Pressure is more commonly expressed in pounds per square inch. One square foot contains 144 sq. in., so the pressure on 1 sq. in. would be 1/144 of the pressure on 1 sq. ft., or $P = 4.33$ lb. per sq. in.

Since the column of water 10 ft. high exerts a pressure of 4.33 lb. per sq. in., a column of water 1 ft. high would exert one-tenth of that amount of pressure, or 0.433 lb. per sq. in. Anyone who makes calculations concerned with pressures will find that this is a convenient factor to remember, namely:

1 ft. of water pressure = 0.433 lb. per sq. in.

In Fig. 2 we have a condition which more nearly represents an oil well, but which involves the same fundamental principles as those discussed in connection with Fig. 1. In this illustration we will calculate the bottom-hole pressure of a well open to the atmosphere at the surface and containing an oil 0.7 times as heavy as water.[1]

The well is 2,300 ft. deep, contains 2,000 ft. of oil and is open to the atmosphere. Then, there is no pressure above the oil surface except atmospheric pressure.

In calculating the bottom-hole pressure, we will simplify the concept by imagining a column of square cross-section extending from the bottom of the hole to the liquid surface, any horizontal section of such imaginary column being 1 ft. square or 1 sq. ft. in area. The bottom-hole pressure may be calculated in the following manner.

Since the oil is 0.7 times as heavy as water, its density will be

$D = 0.7 \times 62.4 = 43.68$ lb. per cu. ft.

Then if we further imagine that our imaginary column is made up of cubes of oil (1 ft. by 1 ft. by 1 ft.) stacked one upon the other above the base of 1 sq. ft. at the bottom of the hole, 2,000 such cubes will be required to reach 2,000 ft. above bottom, and the bottom-hole pressure may be easily seen to be

$P = 2{,}000 \times 43.68 = 87{,}360$ lb. per sq. ft.

$P = 87{,}360/144 = 606$ lb. per sq. in.

It is well to point out that the pressure calculated above would represent the bottom-hole pressure of the well under the conditions mentioned regardless of the size of the hole, regardless of the conditions out in the producing sand when the pressure was taken, and regardless of any other external force not mentioned. Of course, depth measurements used are assumed to be correct, and the density of the oil is considered uniform from the top of the column to the bottom. Presence of tubing in the well would have no effect on the calculations, so long as oil density and liquid level remained the same. It is very important to remember that the amount of pressure exerted by any liquid column depends only upon the vertical height of the column and the density of the liquid above the point at which the pressure is measured.

In later installments we will consider the effect of having two liquids, as oil and water, in a well, and also of having one or more liquids with gas pressure in excess of atmospheric pressure above the liquid level.

[1] In a later installment there will be a discussion of the relationship between various units of liquid density, i.e., Baume gravity, A.P.I. gravity, specific gravity, pounds per cubic foot, etc.

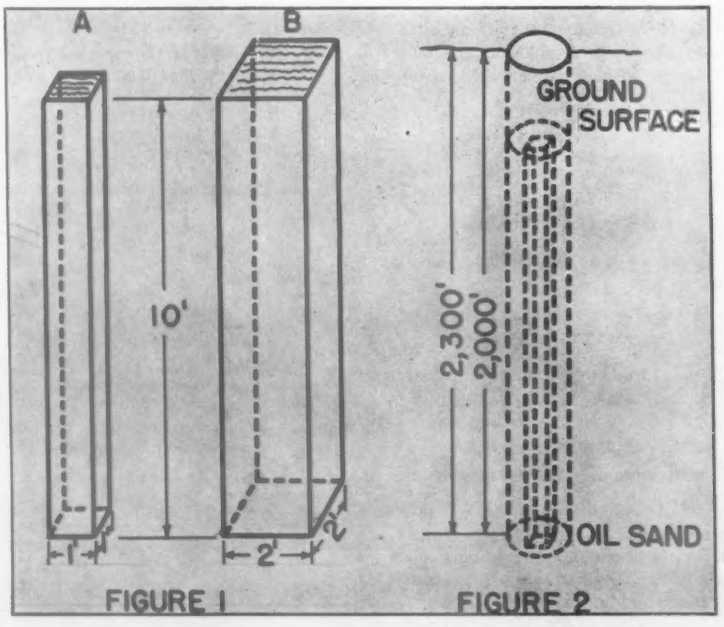

FIGURE 1

FIGURE 2

Defense Line Station Design

(Continued from Page 44)

ers, closed delta connected with secondary voltage delivery of 2,300 volts. In an emergency, if one unit transformer should prove defective, sufficient power could be obtained by operating two of the remaining transformers connected in open delta for short durations of time.

Electric power in sufficient quantities is available for all the pump-station sites selected and the power rates offered by the private utilities were in all cases of equitable levels, justifying its use, when consideration was given to operating labor savings, lower first costs, savings in maintenance and repairs over other methods of pumping.

The operating flexibility of the pipe line, with three units installed in each pump station, is assured, for with two pump units in operation in each station almost 80 per cent of the maximum capacity can be delivered, or if only one unit is operated in each station slightly more than 50 per cent of the maximum capacity of the line can be delivered.

In the cases where decreased capacities are desired, the efficiency of the pumps would be lowered to some extent, to about 82 per cent when two pump units are in service for pumping 200,000 bbl. per day, or 80 per cent of the maximum design capacity. The electric-motor efficiency, however, would not be appreciably lowered since its efficiency is 95 per cent at three-fourths of rated full load.

The electric energy required to deliver a barrel of oil or products from South Central Illinois to eastern tidewater, a distance of about 760 miles, when pumping at the rate of 200,000 bbl. per day (80 per cent capacity) would closely approximate 3.2 kw.-hr.

The proposal for the national-defense pipe line also included about 650 miles of 20-in. or 22-in. to connect the East Texas oil fields and other trunk lines of the Texas producers and refiners. Assuming that the eastern branch of the line would deliver 250,000 bbl. per day, then the 22-in. line could deliver 78 per cent of this capacity, or 194,000 bbl. per day, leaving 56,000 bbl. per day to be provided by the Illinois fields or other connecting trunk lines near Salem. In the event the East Texas connection was installed with 20-in. pipe, its capacity would be 60 per cent of the 24-in. eastern branch, or 150,000 bbl. per day, leaving the remainder of 100,000 bbl. per day to be supplied by Illinois or connecting trunk lines near Salem, Ill. In either event, the pumping energy required by the 20-in. or 22-in. line, using electric power, would closely approximate the electric energy requirements of the 24-in. line in terms of kilowatt hours per barrel per 100 miles, because the pumps and motors would have the same approximate over-all efficiencies. This southern portion of the pipe line originating in East Texas would be about 650 miles long, terminating in Salem, Ill.

Ordinarily the electric pumping costs amount to 35 per cent of the total pumping costs, with lines of 12-in. to 8-in. pipe when 10 to 15-year payout periods are considered. In the case of this national-defense pipe line, the electric-power costs, when operating at high-load factors and shorter pay-out periods are considered, amount to only about 20 per cent of the operating expenses of the line.

This is due to the better over-all efficiency of the pumps and motors designed for use in the defense line. It is estimated that oil or products can be pumped for about 2 cents per barrel per 100 miles by the defense pipe line.

A profile of the proposed 24-in. section (eastern 760 miles) of the pipe line is shown to indicate the approximate balancing of the initial pressures at each pump station, for the line has to pass over the Allegheny Mountains through Pennsylvania.

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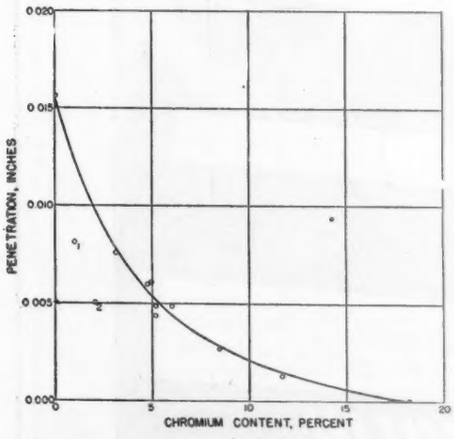
Progress in METALS

By W. L. NELSON

Corrosion of Steel by High-Temperature Steam

STEAM temperatures in modern central power stations are approaching those used in the commercial production of hydrogen by the reaction of steam with iron, and hence a study was undertaken by Solberg, Hawkins, and Potter, of Purdue University. The results of this study are reported in "Corrosion of Unstressed Steel Specimens and Various Alloys by High-Temperature Steam," which was presented before the October meeting of the American Society of Mechanical Engineers, at Louisville, Ky.

Steel specimens were exposed at temperatures of 1,000°-1,400° F., at 400-1,600 lb. per sq. in., and for times up to about 2,000 hours. Corrosion was measured by stripping the scale from the specimens by means of electrolysis in a 10 per cent solution of sulfuric acid containing 1 g. per liter of quinoline ethiodide as an inhibiting agent. Under these conditions the acid attacked the steel to a negligible extent but it did dislodge the scale. A number of other inhibitors, with and without the use of an electric current, were examined and most of them were unsatisfactory for this purpose.



Chromium was the most specific alloy element in halting corrosion. The figure on this page indicates the approximate depth of penetration as a function of chromium content. Points 1 and 2 on this figure showed a better than normal resistance. This may be attributed to other alloy elements than chromium, i.e., vanadium in the S.A.E. 6120 steel represented by point 1, and relatively high amounts of aluminum and silicon in the Alcrosil steel marked point 2. The effect of steam appears to be generally the same as the effect of sulfides and high-temperature oxidation on the chromium steels. By taking a gross average of all of the data recorded in the paper, the following tabulation will assist in formulating a generalized idea of the corrosion of steel by steam.

PERCENTAGE PENETRATION OF ALLOY STEELS AS COMPARED WITH THE PENETRATION OF CARBON STEEL

	Per cent penetration compared with carbon steel	Range of per cent penetration	Number of data used
1. Plain carbon	100		6
2. Carbon moly	99.6	90.5-114	6
3. 2 chromium moly	83.0	65.5-100	9
4. 1.25 chromium moly	76.2	64.5- 95.5	3
5. 3 chromium moly	75.0	48.4-100	10
6. S.A.E. 6120, chromium vanadium	66.9	51.8- 82	2
7. 4-6 chromium moly	66.2	34.1-103	14
8. 4-6 chromium moly (Al & Si)	32.3	.....	1
9. Alcrosil	32.1	..	1
10. 4-6 chromium moly (Cb.)	27.8		1
11. 9 chromium moly	19.7	3.9 -40.7	13
12. 7 chromium moly	15.6	14.9- 16.4	2
13. 12 chromium	11.5	0.9- 25.6	9
14. 12 chromium (with high Si.)	5.8	.....	1
15. 18-8 chromium nickel (Cb.)	2.8	0.1- 7.6	9
16. 18-8 chromium nickel	1.35	0.1- 2.6	2

The somewhat wide ranges in the table are due to a large extent to the length of test—the rate of corrosion being rapid during the first hours of exposure. In addition, some of the data used represented the average of many tests whereas others were obtained by only one test specimen. Although the tabulation is not altogether satisfactory, it should be borne in mind that plant practice will also fail to duplicate the conditions maintained during these tests.

The authors' conclusions are as follows:

"1. The resistance of alloy steels to high-temperature steam is greatly influenced by the amount of chromium present. Alloy steels containing 7 per cent or more of chromium are very resistant to corrosion produced by steam at temperatures up to at least 1,400° F. The 18-8 stainless steels showed practically no corrosion when subjected to steam at temperatures up to 1,400° F.

"2. The corrosion rate is very rapid during the first 500 hours of testing and then gradually diminishes as the time of exposure to the steam continues.

"3. Steam temperatures greatly influence the corrosion of steels. Except for steels containing 7 per cent or more of chromium, the corrosion rate increases very rapidly at temperatures in excess of 1,100° F.

"4. The steels tested may be grouped into three general classes according to the type of scale formed. The first group consists of low-carbon steel, carbon-moly, and the low-chromium steels which are covered with a thick, porous, tightly adhering scale. The scale which forms on the steels of the second group, that is, the 4-6 Cr steels and the 2 Cr-Moly-Al-Si steel, is very brittle and easily flakes off under fluctuating temperatures. The third group consists of steels having a chromium content of 7 per cent or more upon which a very thin nonporous tightly adhering scale is formed.

"5. Scale formed on the inner surface of a tube does not flake off as readily as the scale which has formed on the outer surface of a tube."

Identification of Nickel In Alloy Steels

AN important source of nickel and other alloy steel elements is alloy-steel scrap, but great difficulty and bother is encountered in distinguishing between all of these types of scrap. The recent short item by T. H. Williams, of Bowser-Morner Testing Laboratories, Dayton, Ohio, discloses a relatively simple and dependable method of detecting small amounts of nickel in steel. (Ind. Eng. Chem. Anal. Ed. Jan. 15, p. 72, 1942.)

The test is conducted by putting one drop of a special acid mixture on the steel. After 15-30 seconds this solution is absorbed on a specially prepared paper test strip impregnated with dimethylglyoxime, and if nickel is present, a distinct red discoloration appears when the test spot is washed with two or three drops of potassium hydroxide solution. The reagents, etc., are prepared as follows:

Acid mixture: 25 ml. of distilled water; 10 ml. of sulfuric acid, specific gravity 1.84; 10 ml. of nitric acid, specific gravity 1.42; 10 ml. of phosphoric acid, 85 per cent; and 10 g. of citric acid crystals.

Potassium hydroxide: 30 g. of potassium hydroxide and 90 ml. of distilled water.

Dimethylglyoxime, 1 per cent, isopropanol.

Test papers: Strips of filter paper dipped in a solution containing 10 g. of citric acid, 25 ml. of distilled water, and 10 ml. of 1 per cent dimethylglyoxime in isopropanol. Strips are thoroughly dried and can be kept in stoppered bottles.

The success of the method over other similar methods was made possible by the development of the special acid mixture which eliminates the confusing effects of other elements than nickel.

Gas Cracking for Carburizing

A LATE innovation in the operation of carburizing and case-hardening steel is the development of a special furnace which is used to crack methane or propane gas into carbon monoxide by Borg-Warner Corp. of Muncie, Ind. Perhaps the term partial-combustion would describe the operation more precisely than the term cracking. The gas (and some air) is heated to about 1,800° F. and is then passed through a tube of nickel oxide catalyst. This converts much of the gas into carbon monoxide. The carbon monoxide is then introduced into the carburizing furnace with a small addition (2 per cent) of raw gas. This produces parts that are relatively free from soot and even the furnace is so free from soot that operation can be continued for a month or more as against the usual weekly shutdown for cleaning. A saving of 50 per cent in the gas required for the entire carburization is claimed for the new furnace or operation. Other advantages of the process are the increased length of life of the furnace rails and fixtures and less frequent shutdowns for repair of the furnace.

Improvements in carburizing processes are of extreme importance today because steel manufacturers are having great difficulty in supplying the enormous number of carburized parts that are needed for army trucks, army tanks, and aviation engines. Many of the recently installed continuous gas carburizers are actually complete heat-treating units, in that they automatically carburize, quench, wash, and temper the parts. The equipment in one large gear plant also automatically burns the carbon and oil from the trays and fixtures of the furnace.

REFINERY ACTIVITY AND EXPANSION

Continental, Air Reduction Form Chemical Affiliate

Continental Oil Co., Air Reduction Co., and the latter's affiliate, U. S. Industrial Alcohol Co., have joined in creating a new concern, Petroleum Chemicals, Inc. The new company, according to reports, will develop production of synthetic organic chemicals.

The new company is owned 50 per cent by Continental and 25 per cent each by Air Reduction and U. S. Industrial Alcohol.

An experimental plant and research laboratory has been in operation for some time at Baltimore, Md.

Fluid Catalytic Cracking Plant Nearing Completion

BAYTOWN, Tex.—The fluid catalytic cracking unit which has been under construction for several months at Humble Oil & Refining Co.'s refinery here will be completed around July 1. Development of the fluid catalytic cracking process to commercial stature was announced in 1940 by Standard Oil Co. (New Jersey) in behalf of its subsidiary, Standard Oil Development Co.

The unit now nearing completion here will be one of the first commercial plants of its type to go into service. It is expected to function in connection with other facilities for the production 100-octane components, toluene and synthetic rubber.

Repair work was completed last month on a 25,000-bbl. distillation unit that had been inactive for several weeks. Completion of the repair work raised the crude capacity of Humble's plant here to 185,000 bbl. daily. Cracking capacity, consisting of Tube and Tank and Cross installations, is now rated at 37,500 bbl. daily, exclusive of the new fluid catalytic unit nearing completion.

Hines H. Baker is vice president in charge of refining; H. D. Wilde, Jr., is manager of research and development; E. F. Voss is chief engineer and S. S. Shaffer is chief chemist.

G. L. Farned is superintendent of the Baytown refinery and James Harrop is his assistant.

Superintendents at other Humble refineries are: H. F. Goss, Ingleside, Tex., with W. H. Barger, assistant; C. M. Bell, South San Antonio, Tex., with E. H. Sealey, assistant, and C. M. Dennison at Neches, Tex.

Magnolia to Increase Aviation-Fuel Production

BEAUMONT, Tex.—Processing facilities and auxiliary equipment required to increase production of aviation gasoline by 9,000 bbl. per day are to be installed at Magnolia Petroleum Co.'s refinery here. Arrangements to increase aviation-gasoline capacity have been completed with the Government. No specific time has been projected for completion of the facilities but the prospective expansion in aviation-gasoline demand implies that plant construction will be rushed.

John W. Newton, vice president of Magnolia and general refinery manager, is chairman of the District 3 refining committee. R. R. Jackson is superintendent of the Beaumont plant, and T. E. Schley is assistant.

The Beaumont refinery has crude capacity of 105,000 bbl. daily and cracking facilities for producing 27,900 bbl. of gasoline daily. Cracking equipment consists of Cross, Houdry and Polyform units.

Polymerization Plant Is Being Built by Wilcox

BRISTOW, Okla.—A new polymerization plant is under construction here at the refinery of H. F. Wilcox Oil & Gas Co. The poly plant, designed to improve quality and yield of motor fuel, will operate on gases from the 2,200-bbl.-per-day cracking unit.

W. M. Fraser of Bristow is general superintendent of the refinery which has a crude capacity of 5,500 bbl. daily. K. N. Tiernan is assistant superintendent.

Two Fluid Catalytic Plants Will Be Finished Next Year

NEW YORK.—Catalytic cracking units are to be built this year at Baltimore, Md., and at the New Jersey refinery of Standard Oil Co. of New Jersey. The new cracking facilities, employing the fluid catalytic process, will become available for service during the early part of 1943.

The New Jersey plant, including equipment at Bayonne, Linden and Eagle, N. J., represent combined crude-oil capacity of 124,000 bbl. daily. Cracking capacity, currently consisting of the Standard of New Jersey Tube and Tank process, is 35,000 bbl. daily.

The Baltimore refinery has crude capacity of 37,000 bbl. daily and cracking facilities handling 7,300 bbl. daily.

Extensive Work Considered At Wisconsin Refinery

SHEBOYGAN, Wis.—Addition of thermal cracking, reforming and catalytic polymerization units at the Wisconsin Oil Refining Co., Inc.'s plant here is under consideration. The plant now consists of topping equipment with capacity of 6,000 bbl. per day.

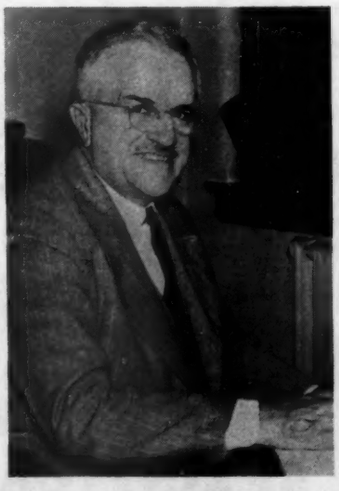
J. A. Crawford of Sheboygan is superintendent of the plant and S. A. McCollum is assistant. The company is headed by W. H. Pauly, chairman, and D. E. Foster, president. Walter Wingrove is vice president. Robert R. Bruggink is chief chemist.

Detroit Refiner Adding 1,200-Bbl. Reforming Unit

DETROIT, Mich.—Aurora Gasoline Co. of this city is building a Dubbs reforming unit with capacity of 1,200 bbl. daily. The company operates two refineries. The Detroit plant, where the reforming unit is being installed, has crude capacity of 5,000 bbl. daily and a cracking unit processing 1,500 bbl. per day. A topping plant with 3,000 bbl. daily capacity is operated at Elsie, Mich.

D. B. McCorvey is superintendent at Detroit and Robert Scott at Elsie. William E. Slaughter, Jr., is president of Aurora and Henry E. Wanger is vice president. H. Erickson is chief chemist of the company and T. P. Bissell is the purchasing agent.

Sketches of Plant Operators . . .



WALTER MILLER, vice president in charge of manufacturing for Continental Oil Co., likes to ride. But all the riding Mr. Miller has done has been on horseback. His climb from yield clerk in an eastern refinery to the vice presidency of a company operating nine scattered plants has given him an insight into men's capacities that has won for him the admiration and respect of the entire refining fraternity. He typifies that rare mixture of executive force and balance that can be accounted for only by a long series of hard knocks and love of duty. More recently he has made an intensive study of organization and office management.

Mr. Miller came to the United States from Switzerland. As a boy he lived in New York City and then in Elizabeth, N. J. In the latter city he completed his elementary school education. After graduating he took jobs as machine hand, blacksmith helper, bookkeeper, and then advanced to a junior executive position in an art-picture reproducing company.

In 1909 he went to Bayonne, N. J., to work as yield clerk in the refinery at Tide Water Oil Co. His spare hours were spent in night school. His interests were chemistry, accounting, and engineering. At Bayonne he reached the rank of process superintendent, and then resigned to join Pierce Refining Co., at Tulsa, as general superintendent of its three refineries. Six months later he was made refinery manager for Cosden & Co., now Mid-Continent Petroleum Corp. During the latter half of 1921 his time was occupied with refinery consulting work for Marland and on January 1, 1922, he took full charge of that company's refining operations. When Marland was merged with Continental in 1929 Mr. Miller continued as vice president in charge of manufacturing.

Much of Mr. Miller's time is now spent in gathering and advising on data going from District 2 to the Washington refining offices of the petroleum coordinator. Mr. Miller was responsible for assembling the "hydrocarbon survey" for this district which in turn is a part of the industry's basic program for most effectively allocating the erection of plants for the manufacture of 100-octane aviation gasoline, toluene, and synthetic rubber.

WHO'S WHO IN REFINING

Pure Oil Company

THE refinery output of the Pure Oil Co. plants includes all the principal products and many specialties. Through the years during which it has been engaged in petroleum refining, the company has consistently devoted a part of its operating program to research and as a result it is credited with important developments in processing methods and with the introduction of new products.

The company's refineries and their capacities follow:

Location—	Dly. capacity in bbl. Crude oil	Cracked gasoline
Nederland, Tex.	48,700	14,800
Toledo, Ohio	25,000	9,700
Newark, Ohio	13,400	5,700
Cabin Creek, W. Va.	5,200	1,490
Midland, Mich.	3,300	.....
Total	95,600	31,690

These refineries are furnished their crude-oil supplies through the Pure's extensive pipe-line system. These lines connect to the company's production in several fields, which now totals approximately 70,000 bbl. daily.

The refineries' cracking facilities are partially of company design and all plants have units of what is known as Combination High-Pressure units. The Nederland and Cabin Creek plants also have Cross cracking units. A large polymerization plant which was designed by the company's engineers was recently placed in operation at the Nederland refinery. The Cabin Creek refinery manufactures lubricants and wax from Pennsylvania Grade crude oil.

The principal offices of the company are located in the Pure Building, 35 East Wacker Drive, Chicago. H. M. Dawes is president and executive head of the company. Refinery operations are in charge of C. B. Watson, vice president. C. R. Wagner, in charge of the company's research and development department and one of the industry's best known chemists, is now in government war service. These duties have been taken over by J. A. Moller and W. B. Ross. Audley Harnsberger, veteran member of Pure's refinery staff, has succeeded Mr. Wagner as chairman of the refinery control board. J. Porter Langfit is assistant to the vice president in charge of refining.

Those in charge of plant operations are: Toledo, R. C. Osterstrom, manager, and H. J. Smith, superintendent; Heath, E. E. McPherson, superintendent, and C. W. Cooper, assistant superintendent; Cabin Creek, J. E. Megraw, superintendent, and D. P. Hankins, assistant superintendent; Midland, O. B. Wendeln, superintendent; Smith's Bluff (Nederland), R. L. Vernor, manager, J. S. Allen, superintendent, and I. E. Hostettler, assistant superintendent.

Standard of Louisiana Is Adding Two Cracking Units

BATON ROUGE, La.—Two cracking units, one thermal and one catalytic, will be completed here this year at the Standard Oil Co. of Louisiana refinery. Combined cracked-gasoline production from the two new units will be 7,385 bbl. daily. Enlargement of the cracking capacity of the Baton Rouge refinery is in addition to installation of facilities for recovery of butadiene and butylene for production of synthetic rubber.

The crude capacity of Standard of Louisiana's Baton Rouge plant is 120,000 bbl. daily. Current cracked gasoline producing capacity is 22,550 bbl. daily.

M. J. Rathbone is president of the company, and M. W. Boyer is vice president and general manager. R. J. Stone is general superintendent. C. L. Brown is manager of research and development and A. F. Fritchie is chief engineer. M. B. Amis is chief chemist and W. N. Cottrell is purchasing agent.

Refiners Asked to Submit Price Questions in Writing

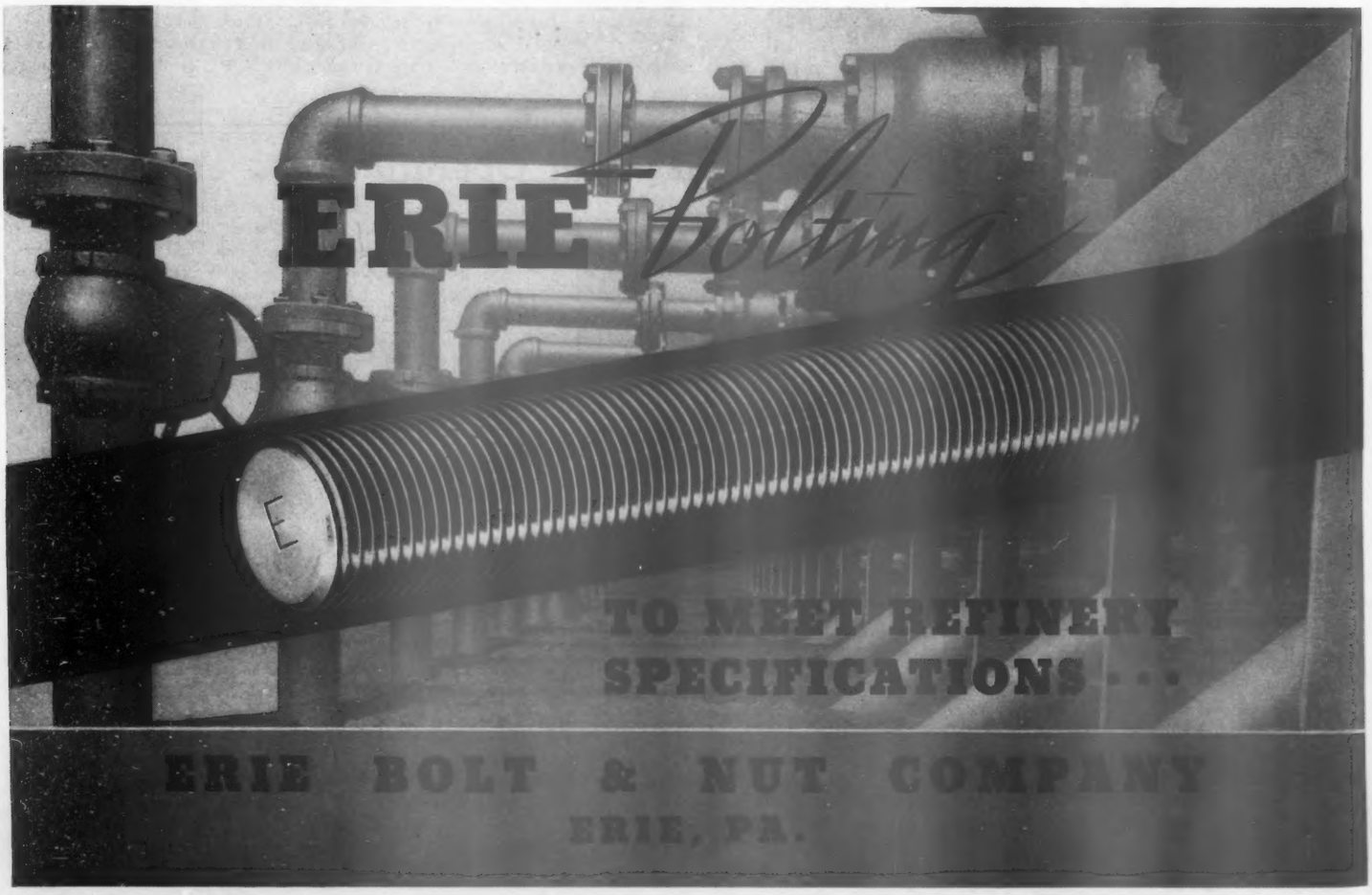
WASHINGTON, D. C.—Refiners and others seeking interpretations of Price Schedule 88 (petroleum and petroleum products) should submit requests for such interpretations in writing at least a week before any contemplated personal consultation with the Fuel Section of the Office of Price Administration, Leon Henderson, administrator, suggested last week.

This procedure, Mr. Henderson said, would permit OPA to prepare interpretations in conformity with Procedural Regulation 1, requiring that all interpretations be in writing. At the same time, he said, it would make possible more effective discussion of the problems when conferences are held.

Desulfurization Unit Proposed by Lakeside

KALAMAZOO, Mich.—Lakeside Refining Co., which operates a 1,700-bbl. skimming plant here, is planning installation of a Perco desulfurization unit.

Glenn W. Hobson is superintendent of the plant. L. W. Brummitt is president and general manager. Arthur Fleischman is vice president and Edward Fleischman is secretary and treasurer.



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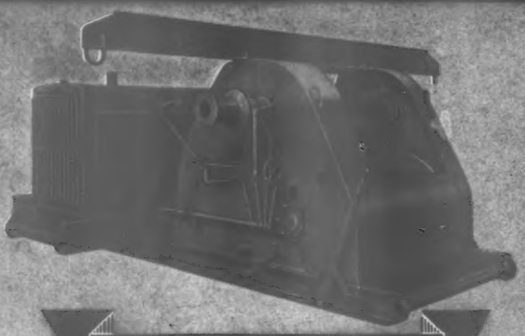
4 Hoisting Speeds—4 Rotary Speeds



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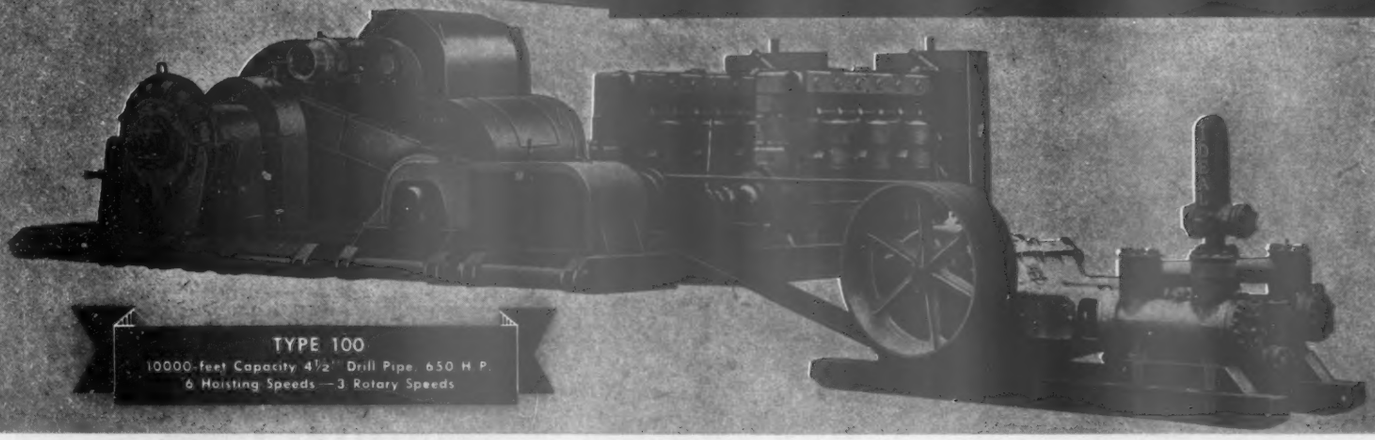
4000-feet Capacity 4½" Drill Pipe, 150 H. P.
4 Hoisting Speeds—4 Rotary Speeds

TYPE 40 SPUDDER
4000-feet Capacity 4½" Drill Pipe, 4 Hoisting Speed—3 Spudding Line Strokes

TYPE 50
5000-feet Capacity 4½" Drill Pipe, 350 H. P.
6 Hoisting Speeds—3 Rotary Speeds

TYPE 75
7000-feet Capacity 4½" Drill Pipe, 500 H. P.
6 Hoisting Speeds—3 Rotary Speeds



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10000-feet Capacity 4½" Drill Pipe, 650 H. P.
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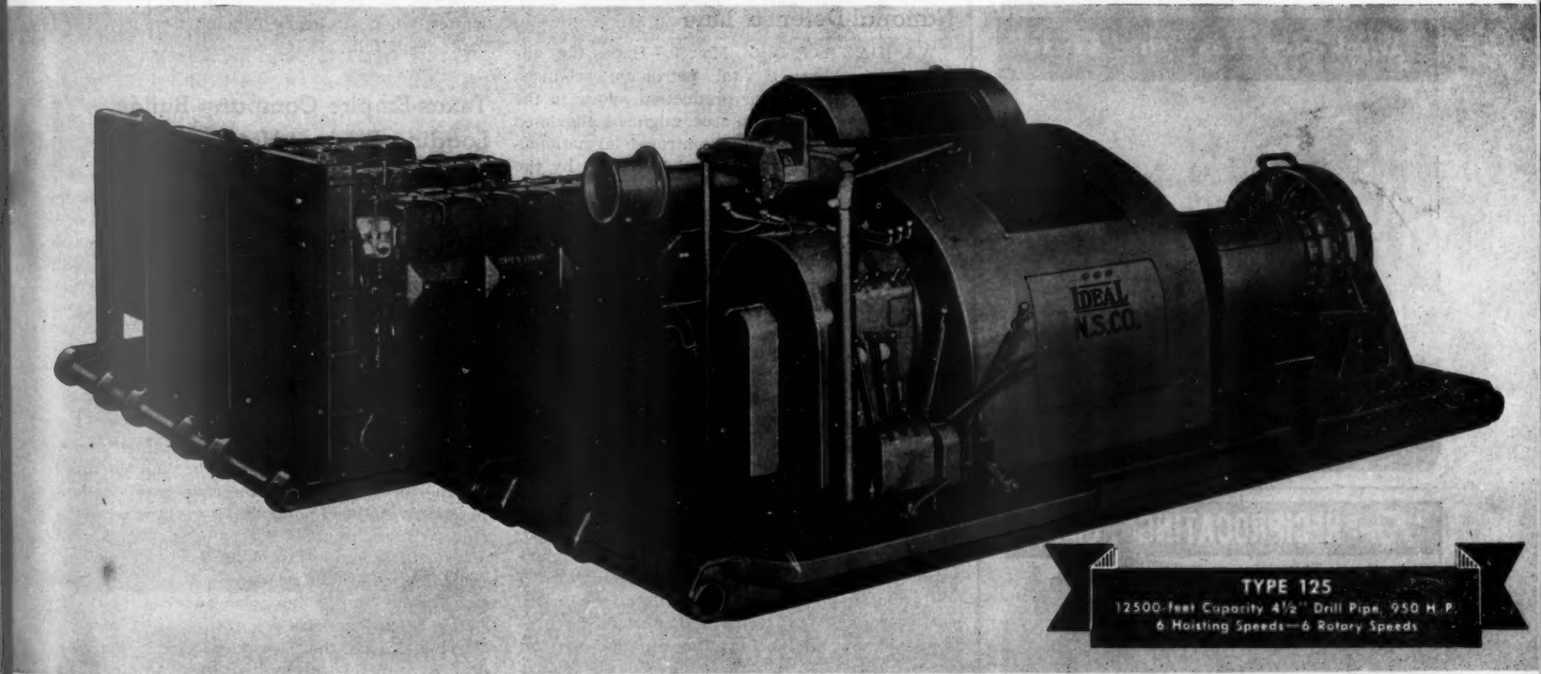

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6 Hoisting Speeds—6 Rotary Speeds

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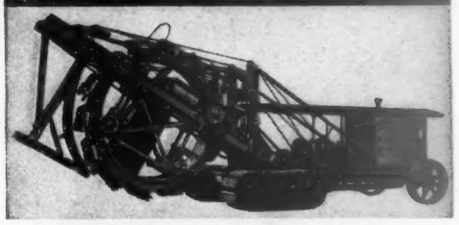

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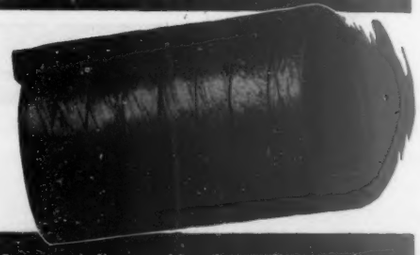

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Pipe-Line Personalities . . . . . C. U. Daniels

C. U. DANIELS, vice president, Oklahoma Natural Gas Co., was born at Kellerton, Ringgold County, Iowa, in 1893. Thirteen years later his family moved to Kansas City, Mo. In 1913 he went to work in the run department of the Gulf Pipe Line Co., Tulsa office. The next year he did general field work in the Cushing field and north of Sapulpa, Okla., as a roustabout and tool dresser on cable-tool wells. In 1917 he built a casinghead-gasoline plant for Panhandle Refining Co., in the Ramming pool, west of Burkburnett, Tex., before he enlisted at Fort Sill, Oklahoma, in the Regular Army. After being transferred to a service division of the Quartermaster Corps at Jacksonville, Fla., he was commissioned as second lieutenant. In 1919 he worked on oil-producing properties in the Wichita Falls, Tex., area. Later in the year he built a fuel-oil pipe line from Burkburnett to the Northwest field for J. F. Darby. For the next 7 years he was in the business of leasing, drilling and producing, and during this time he owned and operated a couple of rotary rigs in North Texas with M. A. Rutis.

In 1927 Mr. Daniels opened an office at Fort Worth, Tex., for the land and geological departments of the Sinclair organization and worked under the direction of H. B. Smith, vice president. Two years later, he resigned and went into business for himself and was established at Fort Worth under the firm name of Adair & Daniels. In 1937 he did some special work in the study of gas reserves for Joseph Bowes, president of Oklahoma Natural Gas Co. In 1938 he was appointed to his present position. In 1917 he married Olive Adair. They have three daughters and a son. Their oldest daughter, Virginia Ann, is now Mrs. William Richards, living in Oklahoma City, Okla., where her husband is with the Peppers Gasoline Co. Olive Jean attended University of Texas and University of Oklahoma, and is now taking a business course at Tulsa High School. Alice Lou attended University of Texas and now attends the University of Tulsa. C. U. Daniels, Jr., is a junior in the Tulsa High School.

Pipe-Line Activity

WPB Refuses Permit for National-Defense Line

WASHINGTON, D. C., Mar. 9.—Hopes that the terrific shortage of vital petroleum products, urgently needed by war production plants in the industrial eastern coastal area, might be alleviated by the construction of the controversial national-defense pipe line, were blasted last week by the War Production Board.

The WPB flatly refused, for the third time, to allocate any steel for construction of the line. Petroleum Coordinator Harold L. Ickes had formally requested, also for the third time, that enough steel be allocated to the pipe line to permit its construction.

This request was based upon the drastically curtailed stocks, along the Atlantic seaboard resulting from heavy sinkings of tankers by Axis submarines which have brought about a dangerous supply situation. In addition to the loss of tanker tonnage through sinkings, a number of tankers have been diverted to direct military service, further reducing available transportation for heavy fuel oils and crude.

It was pointed out that if Mr. Ickes' original request for steel for the line had been granted by the old Supply Priorities and Allocations Board, predecessor of WPB, construction would be well along by now, and before the situation got too bad, some 300,000 to 350,000 bbl. of crude would be moving through it to eastern refineries every day.

In turning down previous requests of the OPC for priority aid in obtaining steel for the big pipe line, the defense agencies declared that the steel was more urgently requested for the construction of tankers and other ships. However, had fewer tankers been built and some of this steel diverted for the construction of the pipe line, observers here point out, there might have been fewer tankers for the Axis submarines operating off the East Coast to torpedo. Such steel as had been diverted would be in the form of pipe which cannot be sunk and which might be expected to relieve the situation before next winter, when the heavy demand for fuel oil will make itself felt.

Texas-Empire Company Builds Loading Rack at Heyworth, Ill.

Tariffs have been published for shipments through the Texas-Empire Pipe Line Co.'s system to Heyworth, Ill., where a loading rack is now under construction. It will be ready for operation the first part of next week. Accommodation will be provided for loading at the rate of 26 cars per day.

Phillips Lets Contract for 296-Mile Project in Texas

Phillips Petroleum Co. recently awarded a contract for laying 237 miles of 8-in. and 59 miles of 6-in. for a system connecting gasoline-plant operations in the Goldsmith, Tex., area with the company's refinery at Borger, Tex. Work will start on the right-of-way about April 1. It is expected that pipe will arrive about April 15. Contract for laying the line was awarded to O. E. Dempsey Construction Co.

During March the Dempsey organization expects to complete preliminary arrangements at the firm's headquarters in Tulsa. A field office for the project will be established within a few weeks possibly at Amarillo, Tex.

In addition to the Goldsmith-Borger project the Dempsey organization is carrying on construction work for looping and extending Phillips Petroleum Co.'s gasoline trunk line running northeast from Borger. This work consists of 74 miles of 8-in. loops along the trunk line in Missouri and a 53-mile 8-in. line from Paola, Kans., to Kansas City, Mo., which are nearly half completed.

Since the beginning of this project Phillips has

increased its program and has arranged to lay an additional 64 miles of 8-in. pipe to enlarge the system moving refined products from Borger. Operations for laying this 64 miles of pipe will start about April 9. Altogether the lines included in these undertakings total 478 miles.

Phillips Applies to FPC After Wisconsin Cancels Permit

The Federal Power Commission announced last week that it had received an application from Independent Natural Gas Co., a wholly owned subsidiary of Phillips Petroleum Co., seeking authority to build an 877-mile 22-in. natural-gas pipe line from Ray, Tex., to Milwaukee, Wis.

The company proposes to sell gas at wholesale to 10 public utilities operating in southern and eastern Wisconsin for resale to the public.

The fight for the Wisconsin natural-gas market again has been thrown wide open.

After a hearing on an order to show cause, the state Public Service Commission revoked a previous order granting a certificate of convenience and necessity to the Wisconsin Gas Transmission Co., subsidiary of the Phillips Petroleum Co., to construct a pipe line into the state.

Nobody objected to rescission of the order and dismissal of previous proceedings on motion of counsel for the Wisconsin Natural Gas Co., a competitor applicant, grounded upon jurisdiction now vested in the Federal Power Commission through recent congressional action.

Southern California Gas Increases Line Capacity

Southern California Gas Co. has increased capacity for transmitting natural gas from the San Joaquin Valley to the southern California area by 20,000,000 cu. ft. daily. This was accomplished by laying 16 miles of 18-in. pipe line from the foot of Tehachapi Mountains to Grapevine, Calif., northwest to a junction with the existing transmission facilities from the Rio Bravo, Ten Section and Paloma fields. At Grapevine the new line ties into the 22-in. which continues over the mountains into the Los Angeles, Calif., metropolitan area.

Southern California Gas Co. has kept in step with the rapidly increasing number of homes established to take care of defense workers in airplane plants, shipyards and other kindred war industries. Many of these new houses were considered necessary to place men in close proximity to their defense work in order to reduce the number of cars on the road during blackouts.

There has been an increase in the number of defense workers in southern California and a further gain will be experienced. The gas companies have been experiencing much the same restriction in facilities as the oil industry and the recent order prohibiting installation of gas heating units in new houses where the principal purpose is heating will prevent the laying of new lines into some areas. In addition the public utilities are confronted with the inability to secure new pipe. Expansion work during 1942 may be limited to small areas, as a result.

Conversion of Gas Line to Crude Service Is Considered

In order to augment facilities for supplying crude oil to San Francisco Bay refineries in California, attention is being directed to the possibilities of converting a 200-mile 26-in. high-pressure gas pipe line from Kettleman Hills to Richmond, Calif., so that it may transport crude oil.

Sunray Enlarges Gathering System

Addition of 15 miles of gathering and connecting pipe lines has permitted the Sunray Oil Co. to take crude from the Bebee field on Pontotoc County, Oklahoma, for its refinery at Allen, Okla., it was announced by F. L. Martin, vice president in charge of refining.

The 4-in. line was built entirely of repossessed pipe, and gives the company a total of 75 miles of pipe line. The company is taking 750 bbl. of oil a day from the Bebee field.

Construction of the line and installation of pumping equipment in the Maxwell and Bebee areas has been handled by the contractor, Pipe Line Service Co. and the company's organization.

Court Sentences Pipe Line Dynamiters After Second Trial

The Macon County Circuit Court, Decatur, Ill., passed sentences on dynamiters convicted on a charge of malicious mischief in connection with the bombing of Texas Empire Pipe Line Co.'s line near Boody, Ill. The same defendants were found guilty in a previous trial of conspiring to dynamite the line and were sentenced from 1 to 10 years.

Sentences following conviction on the charge of malicious mischief in the second trial are as follows: Georgie Diehl and George L. Bruns, 1 to 10 years, minimum of 8 years and 11 months; Harry E. Meisenhelter and Stuart C. Lorton, 1 to 10 years, minimum 7 years; Edwin Roy, 1 to 10 years with no recommendation as to minimum. Cecil O. Wilson, Melvin Watkins and Edward F. Foxx were granted another trial. Louise Chvatal and Pearle Hoskinson were placed on probation after the first trial. They were not prosecuted in the second trial.

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NORTH LOUISIANA, ARKANSAS

Deep Lisbon Well Blows Out From Unsuspected Gas Zone

By R. MARNE SANFORD

SHREVEPORT, La.—Af[ter] having set a new depth record for North Louisiana, a deep wildcat exploratory test went [fur]ther, the past week, and upset predictions [by] encountering a gas blowout at the 11,880-ft. [level] ... Co. [No.] 1 ... choke under pressures of 500 lb. and 800 lb. on the tubing and casing, respectively. The gas-oil ratio was 450 to 1. Rapid development is expected for the immediate area, and th[e] discovery ...

The blowout was quickly controlled by closing the blowout preventer valve. Mud was blown from the hole but the tools and rig were not damaged. At last reports the well was under control, and reported to be only blowing by heads.

Clippings from the January 15, 1942, issue of The Oil and Gas Journal

The operators of this deep wildcat well were prepared for any eventuality. A Cameron 6000 Lb. Test Pressure Operated Drilling Control hook-up was in the cellar to protect their investment in costly drill hole and precious drilling machinery. The control hook-up, similar to the one shown below, consisted of (1) a pressure operated master gate to seal the well bore with pipe out of the hole; (2) a pressure operated blowout preventer to seal swiftly around pipe in the hole; and (3) a pressure operated gate valve to guard against loss of control through the flowline.

Today, only a few wells are drilled below 7000′ in wildcat or proven high pressure areas without the protection of Cameron 6000 Lb. Test Control Units. Since the normal potential bottom hole pressure of any well passes the 3000 lb. mark at 7000′, the operator who drills beyond that depth without 6000 lb. test drilling control units, regardless of mud weight, is inviting trouble.

Operators who are planning exploratory wells are urged to consider the numerous exclusive operating advantages of Cameron Pressure Operated Drilling Control Units and to select those units of *adequate capacity* to withstand the pressures that are likely to be encountered.

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6. **Remote Control**—4-way valves within easy reach of driller eliminates danger to crew and inspires confidence.
7. **Rams Automatically Center Pipe in Hole**—Extremely heavy wing guides on rams center pipe in hole and cannot be bent or fouled, thus assuring complete closure.

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FIELD DEVELOPMENTS...

HIGHLIGHTS FROM THE WEEK'S NEWS—

Completions rose slightly last week to the level of the week ended February 21. Oil wells were up 29, gas wells 6 and dry holes 9 for a total increase of 44. The decline from last year's level of producers while the number of dry holes remains steady shows the result of M-68 which was intended to reduce field completions. The expected increase in wildcatting has not, however, materialized.

Last week the petroleum coordinator showed the inequalities between production and recoverable reserves in a letter addressed to the Oklahoma Corporation Commission. In this letter, he showed the percentage of total reserves of each of the nine leading states, which together account for 96.9 per cent of the total. Comparing his estimates with those of The Oil and Gas Journal (Jan. 29, p. 61) there are three discrepancies which indicate the differencs of opinion which may occur in reserve estimates and the difficulty of satisfying all operators with their accuracy.

Although there is very close agreement between the coordinator and the Journal in the case of six of the states, the coordinator's figures for Wyoming and Louisiana were 33 1/3 per cent higher than those of the Journal, expressed in percentage of the nation's total. With allowables based upon percentage of total reserves, operators in these states would naturally prefer the Government's estimate. In Illinois the reverse is true. Where the Journal credits Illinois with 8 per cent of the nation's reserves, the coordinator only allows it 1.7 per cent.

It seems that this estimate involves more than a difference of opinion. The coordinator shows that during 1941, Illinois produced 40.8 per cent of its reserves, making the figure used by OPC for the balance about 180,000,000 bbl. During the first 3 months of 1942, Illinois will produce more than 30,000,000 bbl. or over one-sixth of this total. If the OPC estimate is correct, Illinois' production must inevitably nose-dive within the next few months, a possibility which the amount of settled sand production renders remote. It is difficult to understand how a state could produce 40 per cent of its recoverable reserves in 1 year.

Shallow production at Spindletop was admittedly wasteful yet the peak recorded for that production of 17,466,000 bbl. in 1902 was not 40.8 per cent of the reserves for the shallow pay. In Illinois, we are not dealing with a small pool with a cavernous reservoir but with a number of fields of which the largest has been kept under control almost from the beginning of its history. Louden certainly did not produce 40 per cent of its remaining reserves in 1941. Salem probably did in 1940 but is now on settled production. The old fields, which have produced more than 3,400,000 bbl. a year for many years will probably produce another 35,000,000 bbl. It is very questionable whether even the rapidly developed 1941 discoveries produced anything like 40 per cent of their reserves in 1941.

ILLINOIS: Oil in the Cypress is reported from a Franklin County wildcat while a well northwest of Carmi in White County has oil in the Aux Vases. A pool opener south of Storms has been completed as a small pumper with nearly 50 per cent water. North Simms has been extended to the west (p. 81).

CALIFORNIA: Efforts are being made to increase heavy crude production. A unit plan for operating the Canal field has been agreed upon. A test is flowing south of a supposed fault which was believed to cut off Newhall-Potrero production. The Del Valle field is proving a disappointment as water is coming in rapidly (p. 71).

LOUISIANA GULF COAST: A test which penetrated salt on the southeast flank of the Avery dome is testing showings in sand under the overhang. Gas-distillate production at Lewisburg has been extended. New deep sands have been opened at Lake Chicot and Potash. Delta Farms is extended ½ mile northeast (p. 73).

TEXAS GULF COAST: A prospective pool opener in the Aldine area, Harris County, is testing a number of sands in the Yegua. A deep Frio sand is showing oil and gas at Texana. Along the Wilcox trend, a test in the Willis area, Montgomery County, is showing oil in the upper Wilcox and two Tyler County pools have been extended (p. 72).

SOUTHWEST TEXAS: Four new pools are promised by showings in scattered wildcats, a structure south of La Rosa, Refugio County; a new area northeast of Driscoll townsite, Nueces County; another 3½ miles southeast of Springfield, Jim Wells County, and a third 6 miles southwest of Donna, Hidalgo County. A test 1 mile north of production may extend Seeligson, Jim Wells County (p. 77).

ARKANSAS: With dry holes on the northeast and northwest and wells on the southwest flank running low, the new Midway pool is open only to the southeast (p. 76).

INDIANA: First oil from the Osage limestone is reported in Gibson County (p. 85).

MICHIGAN: Another county, Lake, may enter the list of oil producers if showings in the Traverse lime develop into commercial production (p. 83).

NORTH TEXAS: The Joy pool is undergoing development following approval of a 40-acre spacing plan. The Watson, Clay County, pool opener has been gaged and flowed 206 bbl. in 6 hours. West outposts to the Ringgold pool are showing oil (p. 68).

WEST TEXAS: The Fullerton discovery in Andrews County has started a new deep trend play. Barnhart, Reagan County's deep Ellenburger pool, has been extended 1½ miles east (p. 74).

EAST TEXAS: A new Gloyd sand pool has been opened in Cass County, north of the Rodessa field (p. 68).

COMPLETIONS IN ALL FIELDS . . .

(Week Ended March 7, 1942)

	Oil	Gas	Dry	Total	Footage	Ttl. comp. to date 1942	Ttl. comp. to date 1941
N. Y., Pa., and W. Va.	34	16	4	54	121,986	804	781
Ohio	4	6	5	15	39,355	206	249
Indiana	0	2	4	6	7,633	82	69
Kentucky	2	1	0	3	3,959	73	100
Illinois	15	0	9	24	64,381	417	514
Michigan	4	0	6	10	24,854	151	161
Kansas	13	0	12	25	78,261	340	290
Nebraska	2	0	0	2	4,922	9	16
Missouri, Iowa	0	0	0	0	0	2	2
Oklahoma	21	2	15	38	115,631	314	253
Texas:							
North Central Texas	6	0	15	21	54,031	343	459
West Texas	37	0	5	42	201,279	404	329
Texas Panhandle	6	1	0	7	20,835	136	89
East Texas	3	0	3	6	31,330	101	208
Texas Gulf Coast	17	0	9	26	156,972	196	179
Southwest Texas	13	2	9	24	120,258	283	271
Total Texas	82	3	41	126	584,705	1,462	1,535
North Louisiana	8	0	2	10	36,281	133	110
Louisiana Gulf Coast	5	0	3	8	70,696	140	146
Total Louisiana	13	0	5	18	106,977	273	256
Arkansas	3	1	1	5	29,450	29	31
Mississippi and Southeast	0	0	0	0	0	23	30
Montana	1	0	0	1	2,956	33	49
Wyoming	2	0	1	3	15,490	17	26
Colorado	2	0	0	2	9,163	4	5
New Mexico	3	1	1	5	15,611	53	58
California	11	2	8	21	93,715	206	201
Total United States	212	34	112	358	1,319,049	4,498	4,629
Total previous week	183	28	103	314			
Week ended Mar. 8, 1941	307	57	106	470			

Service on Active Fields

K.M.A. ELLENBURGER FIELD, TEXAS

Geographic Location

Southwest portion of the K.M.A. (Kemp-Munger-Allen) old field and deep field in southern Wichita County, south of the Wichita River and extending slightly into Archer County, about 20 miles west of the city of Wichita Falls and 15 miles southeast of Electra townsite.

Terrain

Gently rolling prairie with native growth of mesquite pretty well cleaned out by development of the old field. Elevation, 1,015 ft.

Supply Stores and Hauling Facilities

Surfaced roads connect with Wichita Falls and Electra where supply stores have been serving North Texas fields for a quarter century.

Water Supply and Fuel

Water is obtainable from the Big Wichita River or can be bought from a water system running through the field from Beaver Creek, about 2 miles north of Kadane Corner. Gas from old wells supplies fuel for steam rigs. Some diesel rigs are in use. Electric power is available on the edge of the field from Texas Electric Service Co.

DEVELOPMENT

Discovery Well

Fain-McGaha 16-B Eph Griffin, W. H. Spillers Survey, which came in on the southwest portion of the K.M.A. old field in April 1940, for an initial potential of 800 bbl. a day through 1-in. choke. Ellenburger (Ordovician) lime was penetrated to a total depth of 4,489 ft.

Subsequent Development

In June 1940, Magnolia Petroleum Co. drilled the second Ellenburger well about a mile southeast of the discovery on the Thom lease. This well made about 60 bbl. a day with an equal amount of salt water from 4,419-23 ft. It established the water table for that portion of the field.

Further development did not get under way until 1941. During that year, however, 110 wells were drilled, all in the southwest portion of the old fields. This development led to discovery of Ellenberger pay at the Consolidated pool, due north of the K.M.A. Ellenburger. While the area between the two pools has not been drilled, it is believed unlikely that they will join because of the known structural conditions.

Production was extended from K.M.A. into Wilbarger County during the last week in February 1942, when Consolidated Oil Co. 1-D A. D. Potts, H.&T.C.R.R. Survey, came in for about 2,500 bbl. a day 2 miles northwest of the field. Pay came from 4,496-4,530 ft. which included both the Ellenburger and the overlying Mississippian lime.

OWNERSHIP OF PRODUCING WELLS

	No.
Blanco Oil Co. and Buchanan	3
Buffalo Oil Co.	7
Cochran & Cain	3
Consolidated Oil Co.	8
Deep Oil Development Co.	3
E. C. Oil Co.	1
H. D. Egger	1
Fain-McGaha	15
Golding & Cochran	3
Iowa Pavne Oil Co.	1
P. G. Lake	1
Magnolia Petroleum Co.	3
Murchison & Wynne	3
Panhandle Refining Co.	1
Shell Oil Co.	29
Texas Co.	2
Tide Water Associated Oil Co.	29
Ven-Mex Oil Co.	5
Total	118

GEOLOGY

Method of Discovery

Deep test on a structure known since 1918. Several wells, including the discovery well of the Strawn (deep) horizon, had been drilled to the Ellenburger in other parts of the field without success.

Spacing Pattern, Proven Acreage, Reserves

Twenty-acre spacing until December 23, 1941, when rules were made to conform to 40-acre requirements of Preference Order M-68. Clarification of M-68 will be required for much of the Ellenburger development since present interpretation would prohibit drilling on 40-acre units already producing from other pay zones. OPC has indicated Ellenburger wells will be spaced without regard to old wells in other pays. More than 3,600 acres are in production, not including the 2-mile-west extension made in February. Reserves are estimated at 26,600,000 bbl. remaining, again without regard to the recent extension.

Type of Structure and Pay Zones

West flank of the K.M.A. uplift, but structure of deep zones showing only slight regional resemblance to the shallow pays. Ellenburger (Cambro-Ordovician) lime is the only pay zone considered since other pays are classed as separate fields. It is found at from 4,372 to 4,500 ft.

Production, Allowable

Production at the end of 1941 was 130,000 bbl. a month from 118 wells. Proration is based 50 per cent on acreage and 50 per cent per well. Until November 1940 production figures were included in K.M.A. totals. Production in November was 1,440 bbl. and in December 1,769 bbl. Production during 1941 totaled 613,173 bbl. Per-well allowable averages 50 bbl. a day, with total allowable 3,080 bbl. and total well allowable 3,068 bbl.

DRILLING AND COMPLETION

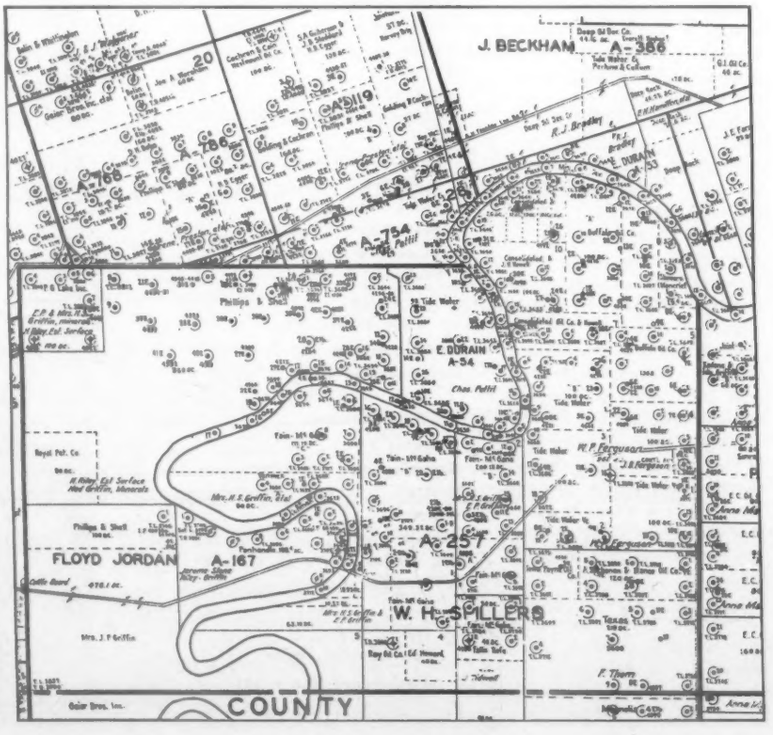
Types of Rigs, Drilling Time

Rotary rigs are used exclusively. From 12 to 14 days of drilling are required to complete a well, depending on location within the field. No unusual problems are presented, and the variance in time is accounted for by condition of the pay and depth of the hole.

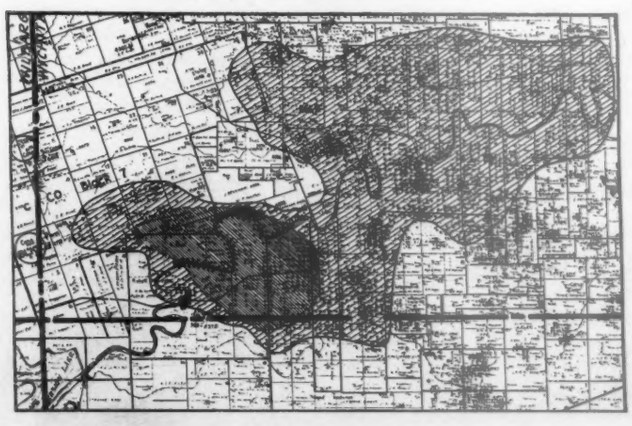
Casing and Hole Size

General practice is to drill 9-in. hole, set 7 in. casing on top of the pay at approximately 4,400 ft. A 10-in. surface string is set at 110 ft. Shell Oil Co., Inc., pioneer in slim-hole drilling, has extended the practice to this field, drills 7⅞-in. hole

Right: Large scale map of Ellenburger producing area in K.M.A. field, Wichita County, Texas. Ellenburger wells are marked "E" or "Elb."



Below: Outline of the K.M.A. pool is shown here by the shaded area. Ellenburger production is shown in the southwestern part of the field by opposite shading. Circled at left are two successful Ellenburger outposts which may extend the producing area several miles



and sets 5-in. casing on top of the pay and uses 8⅝-in. surface casing. From 350 to 500 sacks of cement are used on the production string—sufficient to back cement above the K.M.A. section with its shale caves.

Number of Bits, Mud Conditions

From 12 to 14 rock bits are required, again depending largely on the tightness of the pay zone. Drilling is routine, natural mud is used from the start, although some operators add a little commercial mud. Mud weight is kept at 9 to 10 lb., viscosity 32.

COMPLETION PROBLEMS

Drilling In

Almost without exception, wells are drilled in with reverse circulation. Some spudders have been used, but the practice is unusual because of the relatively high bottom-hole pressures (2,000 lb.). Procedures vary. In some cases, operators drill into the pay before setting casing, complete the well by drilling the plug and washing hole clean. Another practice is to drill to the top of the pay, set pipe, then drill in with a 4½-in. or 6-in. bit, circulate mud out with water followed by oil. Still another practice is to drill into the pay with a bit on tubing.

PRODUCING PRACTICES

Pumping and Artificial Lift

All but nine wells are now flowing and are expected to continue to flow for many years under restricted allowables. Standard pumping units are used on the few edge wells that require artificial lift. Field is classed as water-drive.

Salt-Water Problems

Unimportant amounts of salt water are produced in a few of the edge wells. Otherwise there is no water in the field. The water table was established by the Magnolia Thom well at —3,375 ft. in the south end. However, wells on the north end have found water at around —3,350 ft. and it is believed the water level varies in different parts of the field. It is probably rising slightly.

Pipe-Line Outlet

Sinclair Refining Co. pipe line.

Crude-Oil Analysis

From a north lease:

TESTS ON CRUDE

Gravity	42.2
Viscosity at 40° F.	45.5
Viscosity at 60° F.	39.5
Viscosity at 80° F.	37.0
Fl. C.O.C.	R. temp.
Pour point	B-25
Water	None
B.s. and w.	.01
R.v.p., lb. per sq. in.	7.8
Sulfur, per cent by wt.	.19
Mg Cl_2	1.6
Color	Green

SUMMARY

	Gasoline	Kerosene	Gas oil	Residue
A.P.I. gr. at 60° F.	61.2	42.8	36.4	24.8
Color		I.N.P.A. dark green		
Sulfur, % by wt.	.020	0.30	.12	.49
Fl. C.O.C., °F.		T.C.C. 133	265	375
Pour point, °F.			0	80
Fire point			310	415
S.U.v. at 100 sec.			39	460
Vis. grav. const.				.841
Sourness	10	10		

Estimated topping and cracking, per cent:

Straightrun gasoline	40.6
Kerosene	8.1
Gas oil	14.4
Residue	34.6
Loss	2.3

A.S.T.M. distillation on gasoline cut:

I.B.P., °F.	96
5 per cent	140
10 per cent	161
20 per cent	193
30 per cent	217
40 per cent	238
50 per cent	262
60 per cent	286
70 per cent	312
80 per cent	340
90 per cent	370
End point	401
Recovery, per cent	97.5
Residue	1.0
Loss	1.5

Sejita Field, Duval County, Is Latest to Find Flank Oil

By F. L. SINGLETON

CORPUS CHRISTI, Tex.—The discovery of crude production from downstructure sands around the flanks of gas-distillate fields continues to open important reserves in the Southwest Texas district. The latest strike was made in the Sejita field, southeastern Duval County, where a unitized block of approximately 10,000 acres is being systematically developed by the Trinity Gas Corp. in conjunction with a recycling plant to be constructed by the company in the near future.

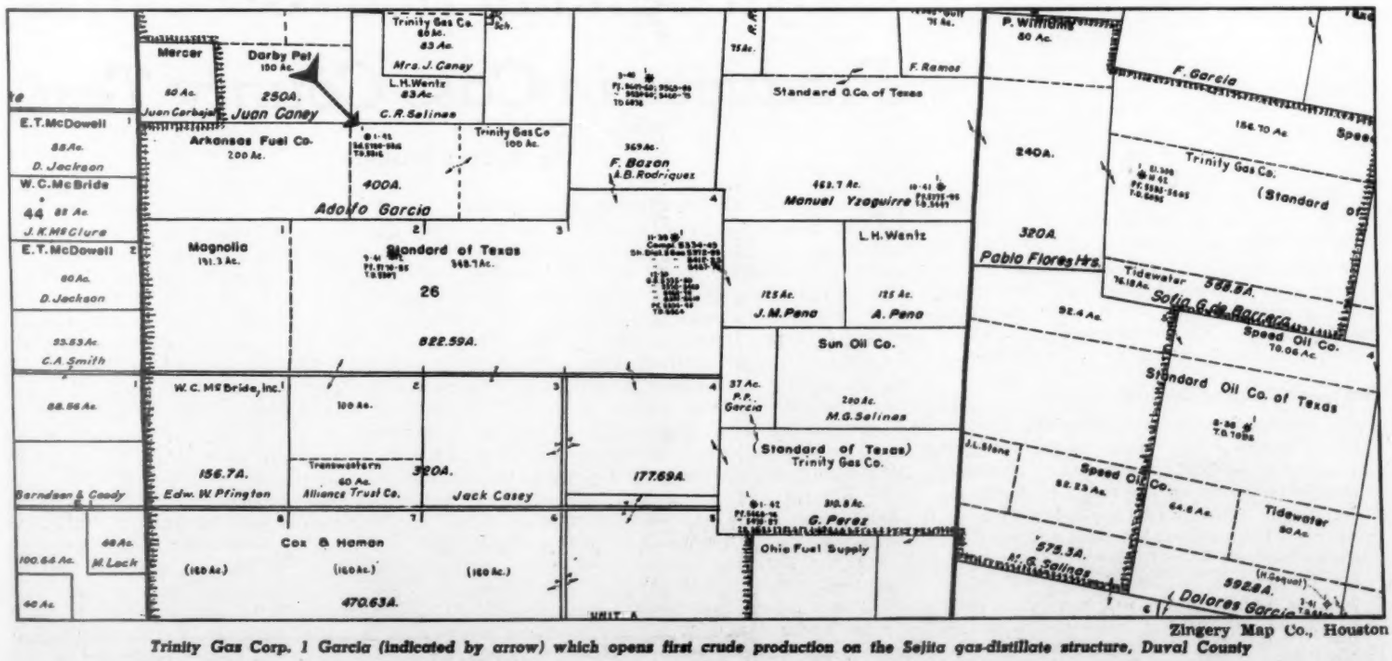
Gas-distillate production was opened on this structure in 1939 by the Standard Oil Co. of Texas. The discovery well, 1 Jack Casey, located in the San Pedro de Charco Redondo grant, was drilled to a total depth of 6,747 ft., and was completed for an initial production of 2,500,000 cu. ft. of gas, and an unestimated amount of distillate per day through a $\frac{8}{16}$-in. choke. Production was obtained by perforating casing opposite four sands in the Hockleyensis formation at intervals from 5,334-6,675 ft.

After completing a second well, 1 Rodriguez, 3,200 ft. to the northwest, Standard Oil Co. of Texas leased the gas-distillate rights on a large portion of its holdings to the Trinity Gas Corp. Prior to the discovery of oil, this company had completed five additional gas-distillate producers, extending production approximately 3 miles in an east-west direction and for a distance of about 1½ miles north and south.

The new discovery is Trinity Gas Corp. 1 Garcia, located on the northwest flank, approximately 2,300 ft. east of the west boundary line of the unitized block and about 2,100 ft. north and slightly west of the nearest gas-distillate producer. The well was drilled to a total depth of 5,930 ft., and was completed by perforating casing opposite oil sand at 5,784-92 ft., and 5,795-97 ft., for an initial production of 25 bbl. of 43.1-gravity oil daily through a ¼-in. choke. Tubing pressure was 750 lb., and casing pressure 1,150 lb.

The well topped the Jackson at 5,257 ft., and the Hockleyensis at 5,257 ft. Correlated with the discovery well, believed to be located on the apex of the structure, 1 Garcia is 297 ft. structurally

(Continued on Page 87)



Zingery Map Co., Houston

Trinity Gas Corp. 1 Garcia (indicated by arrow) which opens first crude production on the Sejita gas-distillate structure, Duval County

NORTH CENTRAL TEXAS

Development Resumed in Joy Pool Following Plan Approval

By D. H. STORMONT

FORT WORTH, Tex.—Development of the new Joy pool in southern Clay County, 2 miles west of the town of Joy, was starting last week after the Railroad Commission approved a spacing program which conformed to requirements of Preference Order M-68. It was one of the few instances in which pool development was resumed after the recent slump in activity resulting from the 40-acre spacing requirements of that order.

L. T. Burns, who opened the pool last fall at 1 C. L. Wynn, in Block 34, Hiram Williams Survey, Abstract 704, was drilling at 4,325 ft. at 5 C. L. Wynn in the center of Block 34. Consolidated Oil Co. was rigging up at 1 G. W. Scaling, 6,000-ft. test in Lot 12, and Shell Oil Co., Inc., was reported planning to begin operations this week at 1 B. L. Clark Block 35, an east offset to the discovery.

The Joy pool is a two-well producer brought in in September 1941 from Mississippian lime at 5,890-5,967 ft. The discovery well was an old abandoned wildcat, originally drilled to a total depth of 5,204 ft. in the Bend without commercial production. This was in 1938. Such favorable results had been obtained from the Mississippian in other nearby areas last spring and summer that Burns decided to deepen the old well. Production, after acid, gaged 76 bbl. and no water in 3 hours, flowing through 1/64-in. choke on tubing.

Another Clay County deep test was J. S. Bridwell 3 Viola Myers, C. Thompson Survey, which was drilling at 4,335 ft. This test is 2,640 ft. east of 1 Myers, a shallow failure which Bridwell deepened last month to complete as a producer from the Mississippian lime at 5,997 ft. Bridwell had previously drilled 2 Myers, ¾ mile north of No. 1, as the area's deep lime discovery. It was bottomed at 6,098 ft.

Watson Discovery Gaged

Final gage was reported on a Clay County discovery which has been standing for some time—Continental Oil Co. et al 1 Watson, W. A. Farris Survey, which opened a new Caddo lime pool north of the Henderson pool. On a potential test, the well flowed 206 bbl. of oil in 6 hours through ½-in. tubing choke, and no water. It made 88 bbl. the last 3 hours of the test.

Shut-in casing pressures at the start of the test were 780 lb. and 460 lb. at the close. Flowing pressures on the tubing were 380 lb. at the start and 235 lb. at the end. Caddo pay is from 5,455-84 ft., total depth. Roy Lee, trustee, one of the operators on the well, has staked location for 1-A Tom Watson et al, 330 ft. from the north line and 1,730 ft. from the east line of the Farris Survey, or 1,320 ft. east of the discovery well.

Ringgold Outpost Testing

Gulf Oil Corp. 3 Worsham, Section 33, Block 4, H.&T.C. Survey, west outpost to the Ringgold conglomerate pool of northwestern Montague County, was testing on the pump having made 11 bbl. of oil and no water in the last 24 hours of the test. The well was bottomed at 5,999 ft. in dry gray lime.

Still farther west of the Ringgold area, Gulf 6 Worsham, Section 37-4-H&T.C. Survey, was credited with flowing 215 bbl. of oil and no water in 18 hours from a total depth of 5,540 ft. in gray lime. Discovery of the Ringgold field by W. B. Omohundro et al 1 Seay in August 1940 launched a widespread campaign in the Fort Worth basin and to the southwest in the vicinity of the old Worsham-Gant field. Pays are from the upper and lower Bend and the Ellenburger.

Deep Test Announced For Coleman County

First deep venture in several years for northeastern Coleman County will be drilled by W. M. Holland and Miss Gladys Huffman of Fort Worth. The well, contracted to 3,250 ft., was located in the SW of Section 17, H.T.&B. Survey. It will seek Ellenburger lime production.

The location is 3,000 ft. north of two old wells brought in by Texas Pacific Coal & Oil Co. in 1922 from the Ranger lime at 2,735 ft. These two wells produced oil until 1934. Deepest well to be drilled in the area was a dry hole of the old Roxana Oil Co., put down in 1922 about 2½ miles west to a total depth of 3,540 ft.

Nearest production is the old Echo pool, 3½ miles northwest of the new location, from the 2,400-ft. Strawn sand and the Ranger lime at around 2,900 ft.

WEST CENTRAL TEXAS COMPLETIONS

Wildcats

Brown County: J. C. Hamer 1 W. Lawson, 200 ft. from N line and 1,000 ft. from E line of Sec. 32, B.B.B.&C. Sur., pumped 8 bbl. oil, asnd 755-64 ft., shot, T.D. 764 ft.

Jones County: Carl S. Shoults et al 1 Seth Alston, Sec. 7, H.&T.C.R.R. Sur., Blk. 3, dry, Palo Pinto lime 3,200 ft., T.D. 3,305 ft.

Ungren & Frazier et al 1 Cox & Hamilton-A, Sec. 20, H.&T.C.R.R. Sur., Blk. 4, dry, T.D. 3,418 ft.

Butler & Horne 1 G. W. Murfee, Jones Boster Sur. 276, dry, sand 3,192 ft., T.D. 3,205 ft.

Parker County: Oscar Donely 1 A. C. Lasater, 900 ft. from N and E lines of F. Blodgett Sur. A-87, dry, T.D. 803 ft.

Shackelford County: W. R. Seeds 1 C. B. Snyder, 990 ft. from S and E lines of Sec. 26, L.A.L. Sur., dry, T.D. 437 ft.

Taylor County: C. W. and W. L. Snoddy 1 L. S. Tipton, Sec. 20, T.&P.R.R. Sur., Blk. 18, flowed 184 bbl. in 8½ hr., est. 250 bbl. a day, lime 2,750-71 ft., acid, T.D. 2,771 ft., *discovery*.

Fields

Lewis, Jones County: Wheeler & Daniel 1 D. C. Wilmon, Sec. 33, T.&P.R.R. Sur., Blk. 15, dry, lime 1,890 ft., T.D. 2,100 ft.

Putnam, Callahan County: William D. Austin 1 W. B. Yarbrough-B, 150 ft. from N and W lines of NE NW Sec. 2971, T.E.&L. Sur., dry, T.D. 556 ft.

Wimberly, Jones County: Lester & Duffield, Inc., et al 1 C. T. McCormick, Sec. 23, T.&P.R.R. Sur., Blk. 17, flowed 196 bbl. natural in 11 hr. through ¾-in. choke on tubing, sand 2,221-25 ft., est. 350 bbl. a day, T.D. 2,225 ft.

NORTH TEXAS COMPLETIONS

Wildcats

Baylor County: Mazda Oil 1 Mrs. Anna M. Wirz, Sec. 1, B.B.B.&C.R.R. Sur., Abst. 69, dry, Caddo 5,377 ft., T.D. 5,508 ft.

Clay County: W. A. Spradling et al 1 J. P. Sunday, A. McGown Sur., Abst. 319, dry, T.D. 1,136 ft.

Cooke County: Panhandle Refining 1 J. I. Welch, M. W. Ross Sur., Abst. 553, dry, T.D. 1,932 ft.

S. W. Simms 1 F. H. Dayton, F. Godley Sur., Abst. 293, dry, Ellenburger 1,861 ft., T.D. 1,944 ft.

J. Z. Werby et al 1 W. A. Scroggins, S. R. Yearwood Sur., Abst. 546, dry, T.D. 3,006 ft.

Denton County: Hunt Oil 1 E. W. Forrester, W. Nelson Sur., Abst. 963, dry, T.D. 2,520 ft.

Jack County: Joe A. Worsham 1 G. Sewell, Daniel Crenshaw Sur., Abst. 128, flowed 42 bbl. in 6 hr. through ¼-in. choke on tubing, natural, est. 90 bbl. a day, gas-oil ratio 250:1, gravity 44, pay 4,689-4,715 ft., T.D. 4,715 ft., *discovery*.

Fields

Griffin, Archer County: Roy Lee 1 A. Heden, Sec. 14, Palo Pinto C.S.L. Sur., pumped 43 bbl. oil and 13 bbl. water in 6 hr., est. 125 bbl., 41.5 gravity, K.M.A. lime 4,018-4,100 ft., sand 4,347-49½ ft., T.D. 4,370 ft.

New York City, Clay County: Deep Oil 1 K. N. Hapgood et al-A, James Walker Sur., Abst. 100, pumped 126 bbl. oil and 25 bbl. water natural, Caddo 5,940 ft., Simpson 6,428 ft., T.D. 6,544 ft.

Miscellaneous

Archer County: Young-Kimbell & Bohner 1 J. H. Roberson, Sec. 14, J. W. Harris Club Ranch subd., dry, T.D. 1,456 ft.

Wichita County: L. A. Prince 6 F. P. Warren, D.R.&K. Sur., Abst. 714, dry, T.D. 1,316 ft.

EASTERN TEXAS FIELDS

Gloyd Sand in Rodessa Series Produces in Cass County Test

By ROBERT INGRAM

DALLAS, Tex.—New production was opened last week in southern Cass County by John Messenger et al 1 Benefield & Singleton, Wanhope Survey, in the center of the north 50 acres of the west 91 acres of the east 182-acre tract, nearly 4 miles north of the Lodi sector of the Rodessa field. The well was flowing from the upper Gloyd, second of the Rodessa sections, at the rate of 12½ bbl. an hour through ½-in. tubing choke into the two 500-bbl. tanks on the lease. Pressures were measured at 1,050 lb. on casing and 400 lb. on tubing. Gravity was 40.39 and the flow was cut less than 1 per cent with basic sediment.

Total depth of the well was 6,205 ft. from an elevation of 230 ft. The upper Gloyd was topped at 5,993 ft. Hole was drilled on down to the Dees section, third Rodessa pay, which was topped at 6,153 ft., and 5½-in. casing was set at 6,100 ft. for a test. When the Dees showed water, casing was perforated opposite the Gloyd. On the first attempt, perforations were made at 6,012-26 ft. and in an hour drill-stem test 2 thribbles of drilling water were recovered and 10 thribbles of oil and 4 thribbles of brackish water.

Operators then squeezed these perforations in a move to get away from water intrusion, and reperforated at 5,992-6,010 ft. After that the well began flowing. It virtually cleaned itself and at midweek was flowing at the rate of 25 bbl. an hour through various chokes. The flow settled back to 12½ bbl. an hour by week's end, however.

The gage was announced by the Phillips Petroleum Co. which held a quarter interest in the well and has the east offset which it will drill shortly. Interest in the well was also held by the Texas Co., which has the west offset, and Bob Whalen. W. C. Windsor of Tyler, Tex., who holds the south offset lease, has let contract for a well, and C. C. Gigler, contractor on the

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discovery well, was moving the rig 1,320 ft. north to drill on his own 54-acre lease, obtained as part of the contract deal.

Generally, the new production was classed as a new oil field rather than an extension of the Rodessa field, and it was credited with establishing the existence of a lateral fault extending northward from the main Rodessa fault. It was declared to be the most important East Texas district discovery in the last 15 months or since the discovery of the Hawkins Woodbine sand pool of southeastern Wood County.

Because of its nearness to the new Smackover lime discovery at Midway, Arkansas, which opened a vast new Smackover exploratory area, the new Cass County field was expected to set off a wildcatting campaign of considerable extent for both Rodessa and Smackover production. Potential was to be taken this week.

Freestone Test Is Dry

Plugging orders were given last week for Zephyr Oil Co. 1 Ball, Rionda Survey, a wildcat about 3 miles northwest of the Red Lakes gas area. Woodbine sand was picked up at 5,009 ft. (electrical survey top), or nearly 200 ft. lower than expected. This was taken as an indication that the well was on the same structure as the Red Lakes field. Other electrical survey markers reported were: Pecan Gap, 3,107-3,330 ft.; Austin chalk, 4,204-4,563 ft.; and sub-Clarksville, 4,574-94 ft. Total depth was 5,017 ft., elevation 505 ft.

New Wildcats Started

Search for Woodbine sand pay from a possible shoreline structure in west Nacogdoches County was under way with the start of a wildcat, Fain-McGaha and W. H. Peckham 1 W. A. Yates, 660 ft. from the north line and 750 ft. from the east line of a 97.5-acre lease in the John Durst Survey, 2½ miles southwest of Douglas. Contract depth was 5,500 ft.

Southwest of the Hawkins pool in southeastern Wood County, Herbert Ogg et al spudded and set 200 ft. of 10-in. at 1 P. T. McClung, Sumpter Survey, a Woodbine sand wildcat 1½ miles southwest of Winona in northern Smith County.

Hawkins East Outpost Flows

An outside well on the east side of the Hawkins field in Wood County, located 230 ft. east of a failure, was reported flowing around 85 bbl. of oil a day by heads at week's end. The well was S. H. Killingsworth 2 Green, Moseley Survey. (See The Oil and Gas Journal, March 5, 1941, p. 76.) The flow came under pressures of 240 lb. on casing and 100 lb. on tubing from sand logged at 4,860-76 ft. Casing was set on bottom at 4,897 ft. and perforated opposite the pay. Nearest production is about 1,200 ft. southwest, and the nearest well drilled was the Johnson-Green failure. However, reports have been heard that the well might be a directional hole to the south.

EAST TEXAS COMPLETIONS

Wildcats

Cherokee County: J. G. Mayo et al 1 New Birmingham Development, Newton Sur., southwest of Reklaw, dry, show oil 4,485-88 ft., T.D. 4,510 ft.

Freestone County: Zephyr Oil 1 P. D. C. Ball est., Rionda Sur., 1 mi. NE of Turlington, dry, Pecan Gap 3,107-3,330 ft., Austin chalk 4,204-4,563 ft., T.D. 5,017 ft.

Robertson County: H. A. Clary et al 1 H. E. Scott, H. F. Thornton Sur., 2 mi. W of Franklin, derrick abandoned.

Fields

Chapel Hill, Smith County: Sinclair Prairie 1 W. Walton, S Box Sur., dual well, flowed 272.99 bbl. through ½-in. choke from Pettit, flowed 213 bbl. in 18 hr. through ½-in. choke from Paluxy perf. 5,746-5,818 ft., 74.1 gravity, T.D. 8,282 ft.

Hawkins, Wood County: Humble 2-A Robinson, flowed 97.3 bbl in 6 hr. through ½-in. choke, gravity 26.9, Pecan Gap 3,014 ft., Austin chalk 4,074 ft., Woodbine 4,256 ft., pay 4,498 ft., T.D. 4,827 ft.

Pleasant Grove, Rusk County: O. W. Killam 1 Bass, J. I. Sanders Sur., pumped 212 bbl. oil plus 20 per cent salt water in 19 hr., T.D. 4,372 ft.

O. W. Killam 1 D. R. Richardson, J. I. Sanders Sur., 2 mi. NW of New Salem, dry, T.D. 4,322 ft.

Price Increase Necessary to Raise Heavy Crude Output

By L. P. STOCKMAN

LOS ANGELES, Calif.—Although wildcat drilling in California is on the increase, as had been expected, operators holding productive acreage in proved fields are urgently in need of producing equipment and permission to proceed with normal development work. This is especially true of fields producing heavy grades of crude oil which at present is in such large demand. The production committee for District 5 is attempting to stimulate production of heavy crude oil but is only having mild success for the simple reason that existing prices for heavy crude oil are too low to offer any inducement for operators to undertake additional development and also because of the inability of some operators to secure rods, tubing and other producing equipment. There are a number of wells in the state that could be returned to production if producing equipment was provided and the price for heavy crude oil raised to the point where operators could afford to make the necessary expenditure. Production of crude oil in California has been out of balance for the past several years due to a preponderance in the production of light refinable crude oil. Reduction in stocks of fuel oil and heavy crude has continued uninterrupted down to the present time. It is quite obvious that low prices would prevent reconditioning stripper properties and this is what has happened in San Joaquin Valley fields since early in 1940.

The Pacific Coast representative of the petroleum coordinator has been working on a survey involving production and future production possibilities of heavy grades of crude oil. This survey is scheduled to be finished within another few days after which it will be forwarded to Washington. One of the vital factors contained in the survey revolves around what equipment will be needed to increase production of heavy crude in wells that have been suspended for a long period. It will also be necessary to determine how many wells are suitable or susceptible of rejuvenation or rehabilitation. The outcome of this survey may indicate how much additional production can be developed by rejuvenation work and how many additional wells can be drilled. It will be found that the so-called production plan of M-68 cannot be followed because many producing wells or wells capable of being rehabilitated are located on less than 10 acres.

Operators Agree on Unit Plan for Canal Field

Of primary interest to California operators is the announcement that operators in the Canal field have agreed on a unit plan for development and production of the Canal field in Kern County. This agreement is between Shell Oil Co., Inc., Standard Oil Co. and Ohio Oil Co. in conjunction with the approval of Kern County Land Co., which owns fee title to all producing acreage in the field. Operators have agreed to participate on the basis of their respective leases, which is especially equitable because the field has been practically fully developed. In the event any additional wells are drilled the party owning the lease will bear drilling costs, after which production will be prorated on the basis of acreage. Shell Oil Co. and Ohio Oil Co. are the largest holders of the acreage involved as Standard Oil Co. only has one well and limited acreage around the well in question. While it is not anticipated any change will be made in present operating conditions it is assumed that later some one of the operators will be given charge of operation which will cut production costs and free the unit of duplication of activities.

Test at North End of Tupman Dry

Shell's attempt to develop commercial production in the north end of the Tupman field of Kern County has ended in failure. Shell drilled this outpost, 88-19-B Kern County Land, east of an outpost that Standard drilled and completed a year or so ago. Shell drilled its outpost to a depth of 10,542 ft. and is abandoning the project following a series of formation tests at several points. Exact structural condition prevailing in this particular area is not known but it is assumed there is an overlap or a terrace as Standard's producing well and Shell's dry hole do not correlate with wells of Richfield Oil Corp. to the south in the productive section of the Tupman field. Richfield Oil Corp., which discovered the Tupman field of Kern County simultaneous with discovery of the Coles Levee field to the south by Ohio Oil Co., has reduced its drilling program to two wells but has derricks going up for two more. In addition to this work, Richfield has gone back into the Wheeler Ridge district to drill another wildcat and has location staked for a new wildcat to be drilled about 2 miles northwest of the town of Tulare in Section 33-19s-24e. In the Dyer Creek field of Kern County, Shell found 3 Smith-Cairns wet at 2,332 ft. and has plugged back to 2,312 ft. at which point a good water shutoff has been effected.

SAN JOAQUIN VALLEY COMPLETIONS

Canal, Kern County: Shell 44-14-A Kern County Land, flowed 498 bbl., 37.2-gravity, 0.5 per cent cut, 177,000 cu. ft. gas, 26/64-in. bean, pressures 160/330 lb., T.D. 13,400 ft., P.B. 9,506 ft., perf. 8,407-9 ft., completed in lower Stevens zone (Miocene), Stevens sand 8,050 ft., Vedder zone in drilled interval 12,620-40 ft., Vedder consisted of gray sand.

Coalinga, West, Fresno County: Westates Pet. Co. 1 Coalinga, 14-20s-14e, dry, T.D. 299 ft., 4¾-in. casing 199 ft.

Elk Hills, Kern County: Standard 27-33-S fee, 33-30s-24e, flow 10,000,000 cu. ft. gas, 28/64-in. bean, pressures 500/650 lb., T.D. 2,825 ft. in dry gas sand equivalent of Mya zone.

Greeley wildcat district, Kern County: Macrate & Sons 1 Haberfelde, 32-29s-26e, dry, T.D. 12,035 ft., 13⅜-in surface pipe cemented 1,257 ft., Stevens zone (Miocene) 8,090 ft., Olcese zone 11,180 ft., Vedder zone 11,950 ft., mechanical trouble contributed to abandonment and prevented thorough test of column.

Jacalitos, Fresno County: Wilshire-Annex Oil Co., 45-26-E, 26-21s-15e, flowing 189 bbl., 40.1-gravity, 0.4 per cent cut, 14/64-in. bean, flow pressure 80 lb., T.D. 3,867 ft., perf. 3,820-60 ft., completed in Temblor oil sand of Miocene age 3,828 ft., elev. 920 ft.

Midway-Sunset, Kern County: Merritt-Annex Oil Co. 3 Annex, 34-32s-24e, dry, T.D. 2,002 ft.

Merritt-Annex Oil Co. 8 Fried, 25-12n-24e, dry, T.D. 2,494 ft.

Mojave wildcat district, Kern County: Red Rock Oil Co. 1 Mojave, 13-30s-37e, T.D. 2,942 ft., bottomed in possible igenous rocks.

Mount Poso, Kern County: General Petroleum Corp. 25 Heisen, 16-27s-28e, pumping 206 bbl., 15.3 gravity, 3 per cent cut, T.D. 2,020 ft., perf. 1,975-2,019 ft. in Vedder zone of Miocene age.

Rio Vista, Sacramento County: Standard Oil Co. 4 Perry Anderson, 12-3n-2e, flowing 7,801,000 cu. ft. gas, 32/64-in. bean, pressures 1,400/1,450 lb., shut-pressures 1,570/1,570 lb., T.D. 4,370 ft., P.B. 4,330 ft., perf 4,202-4,329 ft. in Emigh gas zone of Cretaceous age.

Test South of Newhall Potrero Flows by Heads

Cornelius Willis 1 Ferguson, located southeast of the present productive limits of the Newhall Potrero field in northwestern Los Angeles County, is testing the second Modelo zone. Late this week the operator made a formation test at 6,857-7,020 ft. and the well flowed by heads at a daily rate of 125 bbl. with a cut of slightly in excess of 1 per cent. The operator is at present cleaning out and will perforate opposite the first or upper Modelo zone to develop a quantity of natural gas in the hope that this will be sufficient to make a good flowing well. The third Modelo zone, which should prove the best, contained water which necessitated plugging back from 7,519 to 7.020 ft., the base of the present productive interval. This well is being watched with considerable interest by Barnsdall Oil Co. officials because if it results in commercial production it might mean a substantial expansion of the productive limits of the Newhall Potrero field. It has been thought that the southern limits of production at Newhall Potrero are defined by a cross fault so that if Willis gets a good well about 1 mile southeast of production the intervening area will be proved up for Barnsdall as productive. This possible cross fault has not been definitely established as Barnsdall has not drilled a duster in the field since its discovery.

Water Showing Up in Del Valle

The Del Valle field of northwestern Los Angeles County is beginning to become of questionable nature as far as reaching major proportions from a production standpoint as many wells in the field are showing increasing water cuts and well pressures are falling quite rapidly. Of eight completed wells in the field at present, three are cutting from 20 to 50 per cent water. These wells are 1 Barnes, cutting about 20 per cent; 2 Lincoln, cutting approximately 50 per cent, and 8 Lincoln, cutting about 30 per cent. Whether this is due to mechanical trouble remains to be seen although recent developments indicate the water may be from the formation. The productive limits are quite well defined to the north, south and east but the west is still open for development. The San Martinez area, located at the extreme western end of the Del Valle area with about 1 mile of undrilled acreage lying between does not look any better than Del Valle as far as large production is concerned. The two pools may eventually be joined but recent developments indicate they are two separate accumulations.

COASTAL DISTRICT COMPLETIONS

Capitan wildcat district, Santa Barbara County: Milburn & Hamilton 1 Rutherford, 16-5n-30w, dry, T.D. 1,858 ft., in Sespe formation (Miocene).

Del Valle, Los Angeles County: Havenstrite, R. E., 9 Lincoln, 16-4n-17w, flowing 560 bbl., 33.7 gravity, 10 per cent cut, 500,000 cu. ft. of gas, 32/64-in. bean, pressures 300/800 lb., T.D. 7,623 ft., P.B. 6,354 ft., perf. 6,245-60 ft., in second Modelo zone (Miocene).

Newhall-Castaic wildcat district, Los Angeles County: Worland, C. C., 1 Jenkins, 18-5n-16w, dry, T.D. 2,915 ft.

Exception Asked on 1-Acre Turnbull Canyon Tract

In the Turnbull Canyon field discovered a few months ago by Continental in the Turnbull Canyon-Whittier quadrangle, the Getty interests have filed a request for an exception to M-68 for a small parcel in about the center of the Turnbull Canyon field that approximates 1 acre and for which about $15,000 was paid. The tract is in proved territory and in the center of Continental's block. The discovery well at Turnbull Canyon was a pumping well making 225 bbl. per day but the second completion of Continental Oil Co. was

(Continued on Page 86)

TEXAS GULF COAST

Aldine Area Wildcat to Test Series of Yegua Showings

By F. L. SINGLETON

HOUSTON, Tex.—Operators along the Texas Gulf Coast district centered their attention on the Aldine area, Harris County, where Strake Petroleum Co. was testing 1 Phoenix Dairy Co., a prospective pool opener located about 15 miles north of Houston in the Peter Craft Survey. With the hole bottomed in the lower Yegua at 7,991 ft., 5½-in. casing was cemented at 7,798 ft., preparatory to testing a series of sands in the Yegua formation topped at 6,642 ft. At the end of the week, the well had been tested at 7,931-91 ft., 7,770-78 ft., and at 7,731-39 ft., all of which showed some brackish water, a small amount of low gravity oil and gas-cut mud. At the close of the week, the perforations had been squeezed off and another test was slated to be made at 7,180-90 ft. Other sands up the hole to a depth of 6,690 ft. have been logged, and all will no doubt be tested.

In the same county and located in the Crosby area, Atlantic 1 Cohn, a prospective pool opener located in the M. Duncan Survey, just west of the Esperson dome in Liberty County, is drilling in shale below 8,834 ft. with no further showings of oil or gas reported. The well is still believed to be in the Yegua formation, from which the well has been showing considerable gas pressure for the past 3 weeks.

Test May Open Deep Production In Texana Field

Gulf 1 M. K. Simons, a semiwildcat located in the Texana field, Jackson County, is bottomed at 7,801 ft., and casing is being cemented to test sand at 7,618 ft., and 7,726 ft. where side-wall cores recovered sand and sandy shale having an oil and gas odor. Production from this interval would open a new and deeper sand in the Frio where it is found in two wells at approximately 5,200 ft., and 5,700 ft. Several attempts have been made to open consistent production on this structure, but all have failed. Location of the well is in the F. F. Wells Survey. One mile southeast of Ganado, J. F. Hutchins et al have derrick up for 1 A. T. Gray, a projected Frio sand test in the J. Mathis Survey.

Montgomery County Test Logs Shows in Upper Wilcox

H. C. Cockburn et al 2 Foster estate, located in the Willis area, Montgomery County, was being watched with much interest due to showings of oil and gas logged in the upper Wilcox. Approximately 3 ft. of sand with a gas odor was recovered in a core at 6,714-24 ft., while 2 ft. of sand showing 6 per cent saturation was recovered in a core at 6,724-34 ft. Additional sand having an oil odor was cored at intervals from 6,734-54 ft., and the well coring ahead below 7,275 ft. This is an old well drilled by Sturm & Womack to a total depth of 7,265 ft., which is credited with having logged several showings of oil and gas, but no test was ever made. The present showings were logged in a sidetracked hole, which was sidetracked at 5,270 ft.

On the Millican salt dome, Brazos County, Phillips Petroleum Co. is moving in material for 1 Steve Jerichow, located just south of the company's 1 Schoepps, recently abandoned after drilling into anhydrite at 5,180 ft.

Wilcox Extended in Two Tyler County Pools

Wilcox sand production was expected to be extended in two pools in Tyler County. In the Camp Eleven field, American Republics and Houston Oil Co. 2 Cushing-fee, cored the discovery sand at 7,997-8,010 ft., and casing is being cemented for testing. The sand is about normal with the discovery well, located to the southeast. In the Fred area, Stanolind 2 Parker, an offset to the discovery well, was expected to halt drilling after topping sand at approximately 8,170 ft. The discovery well of this field is producing from sand at 8,180-8,200 ft.

TEXAS GULF COAST COMPLETIONS

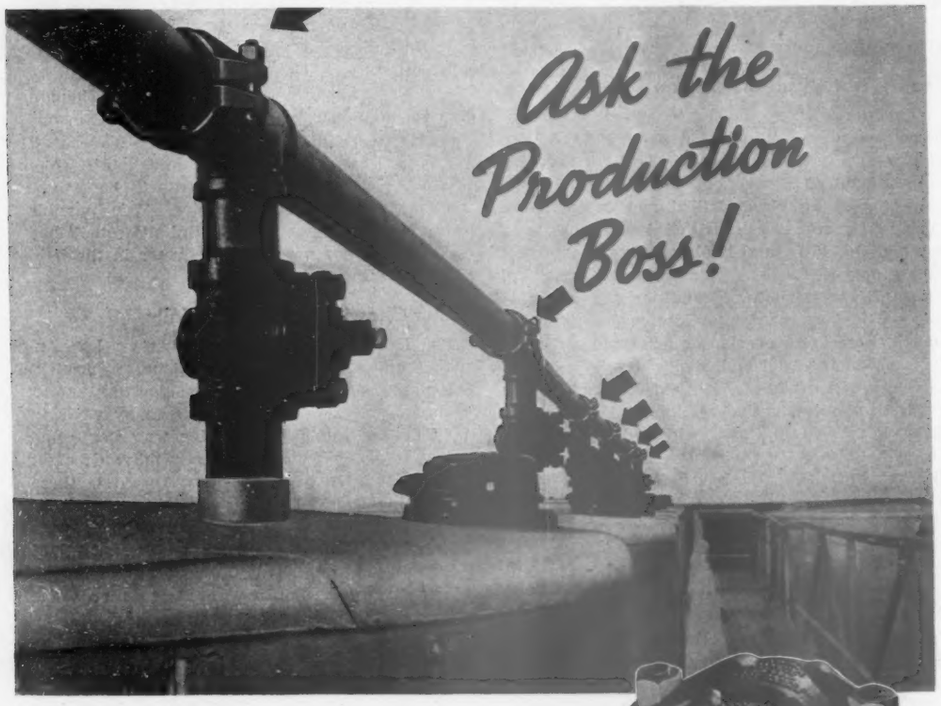
Wildcats

Brazos County: Phillips 1 Schoepps, top anhydrite 5,180 ft., dry at 5,190 ft.

Wharton County: Sinclair Prairie 1 Kubela, dry at 7,615 ft.

Clark & Cowden 1 Kountze, top large Discorbis 5,218 ft., Heterostegina 5,461 ft., round Marginulina 5,704 ft., flat Marginulina 5,734 ft., T.D. 6,519 ft.

(Continued on Page 86)



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LOUISIANA GULF COAST

Avery Island Dome May Have Production in Overhang

By F. L. SINGLETON

NEW ORLEANS, La.—On the southeast flank of the old Avery Island salt dome, Iberia Parish, Humble Oil & Refining Co. was making preparations to test 1 Petit Anse Co. which may open the first production on this old structure. Although little information has been released by the company, the well is said to have drilled into salt at a total depth of 7,000 ft., and the hole has been plugged back to 6,450 ft., where casing was being cemented for testing. Salt was reported to have been topped the previous week and the well drilled out from the overhang at an unknown depth, and is reported to have logged showing of oil or gas at intervals from 6,000-6,371 ft. from which the well attempted to blow out.

Gas-distillate production in the Lewisburg field, Acadia Parish, was extended several hundred feet east with the completion of Stanolind 1 Richard, which flowed at the rate of 82 bbl. of 54-gravity distillate per day through a ⅜-in. choke from perforated casing opposite sand at 10,162-74 ft. Tubing pressure was 2,900 lb. Total depth of the well is 10,252 ft., with the sand section logged from 10,150-10,200 ft., and salt water sand from 10,200-45 ft.

Lake Chicot Outpost Opens New Deep Sand

Although not officially completed, Amerada et al 1 Schwing & Case, a north outpost in the Lake Chicot field, St. Martin Parish, apparently opened production from a new and deeper sand when it flowed 160 bbl. of fluid daily through a ¼-in. choke, while testing through perforated casing at 10,340-44 ft. The oil tested 28.9 gravity, and 10 per cent of the fluid was salt water. The perforations are expected to be squeezed off and another test made in the same sand section. This is the third well to be drilled on the structure on which the company has completed two wells as producers from sands at 8,100 and 9,000 ft.

On the Potash dome, Plaquemines Parish, Humble Oil & Refining Co. opened a new producing horizon with the completion of 57 Orleans Levee Board. Drilled to a total depth of 8,763 ft., perforations were made at 8,707-40 ft., and the well flowed at the rate of 430 bbl. per day through a 7/64-in. choke. Other sands were logged by an electrical survey at intervals from 7,854-7,900 ft., which correlate with the discovery sand.

In the Schooner Bayou field, Vermilion Parish, Union Oil Co. of California 3-A Vermilion Parish School Board, in 16-15s-1e, is bottomed in oil sand at 6,440 ft., and 5½-in. casing was cemented on bottom, preparatory to testing. An electrical survey showed broken sand showing oil at 5,952-83 ft., and oil sand at intervals from 5,998-6,440 ft.

On the south side of the Charenton field, St. Mary Parish, Commerce Oil Co. 2 South Coast Co. is reported to be flowing oil and wash water while testing through perforated casing in a new sand at 9,200 ft. This well was drilled to a total depth of below 11,000 ft., and was plugged back to test the present sand following the running of an electrical survey.

California Co. initial test in the Delta Farms field, La Fourche Parish, extended production about ½ mile northeast when 3 Delta Farms Co. flowed at the rate of 1,505 bbl. daily through various chokes, while testing through perforated casing opposite sand at 8,900 ft. The well was drilled to a total depth of 11,350 ft., and no attempt was made to test the 11,300-ft. sand in which the discovery well was completed. This is the first well to be drilled on the structure in several months, and a continuation of development is anticipated.

LOUISIANA GULF COAST COMPLETIONS

Fields

Belle Isle, St. Mary Parish: Sun Belle Isle, top salt 5,010 ft., dry, T.D. 6,623 ft.

Chacahoula, La Fourche Parish: Sun 13 Dibert Stark et al, 198 bbl., ⅜-in. choke, perf. casing 7,181-7,218 ft., T.D. 7,411 ft.

Neale, Beauregard Parish: Atlantic 1 Lilliedoil, 264 bbl., ¼-in. choke, sand 11,020-42 ft., T.D. 11,797 ft.

Pine Prairie, Evangeline Parish: L. M. Josey 1 Sam Haas, dry, T.D. 8,497 ft.

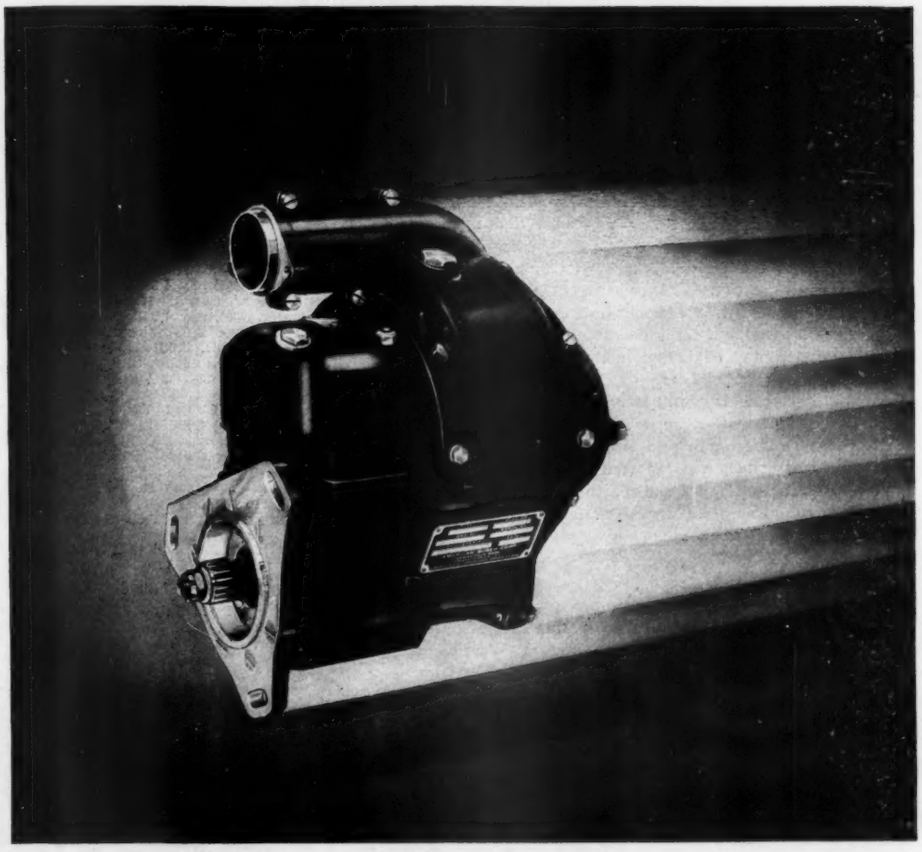
Lake Mongoulois, St. Martin Parish: Texas 11 State, dry, T.D. 10,376 ft.

Potash, Plaquemines Parish: Humble 57 Orleans Levee Board, 430 bbl., 7/64-in. choke, perf. casing 8,707-40 ft., T.D. 8,763 ft.

St. Gabriel, Iberville Parish: George Echols 5-B Gueymard, 196 bbl., 7/64-in. choke, perf. casing 8,532-50 ft., T.D. 8,671 ft.

West Cote Blanche, St. Mary Parish: Texas 11 State, 300 bbl., 10/64-in. choke, perf. casing 7,990-8,000 ft., T.D. 8,558 ft.

SKY HIGH



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AMERICAN BOSCH MAGNETO

Deep Trend Play Developing In Andrews County

By ROBERT INGRAM

MIDLAND, Tex.—Activity in the northwest part of Andrews County was increasing with the success of a deep trend play along which was located the Fullerton pool discovery. The Fullerton well, 1 H. M. Wilson, was completed last week and given an official potential (see completions) while several other wells were drilling in the vicinity.

Newest wildcat in the play was Humble Oil & Refining Co. 1 H. O. Sims, 660 ft. from the north line and 1,980 ft. from the east line of Section 24, Block A-29, P.S.L. Survey. This test was to explore to the lower Permian lime and was scheduled to go to 7,500 ft. The location is only 1½ miles east of Lea County, New Mexico, and only 5 miles south of the Gaines County, Texas, line. It is 13 miles west of the Fullerton strike, also in the lower Permian.

The Fullerton 2 Wilson, Section 15, P.S.L. Survey, a west offset to the discovery well, was drilling below 4,260 ft. in anhydrite and lime, and the same operator's 3 Wilson, also in Section 15, a north offset to the discovery, was drilling below 2,970 ft. All three tests were reported to have topped the anhydrite at 1,690 ft., making them flat on the marker.

One mile to the west, Magnolia Petroleum Co. 1-11-37 Ralph, Section 11, Block A-37, P.S.L. Survey, was bottomed at 3,050 ft. in anhydrite, where 9⅝-in. casing was set. This test found the top of the anhydrite about 10 ft. higher structurally than the discovery.

In southwestern Andrews County, Seaboard Oil Corp. 3 Thornberry, Section 13, Block A-42, P.S.L. Survey, 1¼ miles north and slightly east of the West Fuhrman pool, was reported running slightly higher structurally than wells in the pool and was bottomed in anhydrite. Operator was moving off steam rig to move in power tools due to water shortage.

Deep Well at Extreme North

Lamb County was given one of the deepest wells to be drilled on the north end of West Texas development at an 8,500-ft. wildcat staked by Stanolind Oil & Gas Co. in the Olton area. The well will also be the first deep test for that county and will be considerably north from present production in the Permian basin. It is 1 J. W. Hopping, 1,964 ft. east and 660 ft. north of the SW cor. Section 25, Block T, T. A. Thompson Survey, ½ mile east of the town of Fieldton. Projected depth of the test is believed sufficient to carry the hole to the granite.

J. R. Sharp 1 Holman, 2½ miles south of the one-well Nairn pool, the only well in Lubbock County and the most northerly Permian basin production, was nearing critical depth last week, drilling below 4,526 ft. in lime. Five miles east of the producer, Stanolind Oil & Gas Co. 1 J. F. Stinnett, Labor 18, League 4, San Augustine County School Lands Survey, a 5,300-ft. wildcat, was reported to have found the anhydrite running high for the region. This well, with an elevation of 3,136 ft., topped the anhydrite at 1,470 ft. and was drilling ahead.

NORTHERN WEST TEXAS COMPLETIONS

(24-hr. rating based on last 3 hr. of 6-hr. gage)

Wildcats

Andrews County: Fullerton Oil 1 H. M. Wilson, Sec. 15, Blk. A-32, P.S.L. Sur., flowed 682 bbl. through 1-in. tubing choke after acid, gas-oil ratio 364:1, gravity 43.1, top pay 7,045 ft., T.D. 8,005 ft., P.B. 7,280 ft., *discovery.*

Briscoe County: Phillips 1 Montague, dry, show gas at 5,709 ft., T.D. 8,200 ft. in shale.

Fields

Howard County: F. H. E. Oil Co. et al 1-C L. C. Denman, pumped 140 bbl. after acid and shot, pay 2,775 ft., T.D. 2,878 ft.

Imperial Petroleum 9 Hooks, old well, old T.D. 1,884 ft., T.D. 3,267 ft., shot 3,208-67 ft., pumped 55 bbl.

Moore Brothers 1 H. E. Brindley, pumped 70.38 bbl. after shot, pay 3,184 ft., T.D. 3,313 ft., P.B. 3,250 ft.

Cardinal Oil 1-24-B University, flowed 108 bbl. through tubing, shot, pay 2,139 ft., T.D. 2,166 ft.

Magnolia 2 Gerety, flowed 821 bbl. through ½-in. tubing choke natural, gravity 44.1, pay 5,331 ft., Simpson 4,910 ft., Tulip Creek 4,975 ft., McKee sand 5,290 ft., T.D. 5,339 ft.

Slaughter, Cochran County: Bieg Oil 2 D. S. Wright, dry, T.D. 4,996 ft., P.B. 4,970 ft.

Devonian Oil 2 F. L. Woodley, flowed 277 bbl. through 1-in. tubing choke, acid, pay 4,928 ft., T.D. 4,972 ft.

Honolulu 5-58 Dean, flowed 1,110 bbl. through 2½-in. casing outlet, acid, pay 4,953 ft., T.D. 5,042 ft.

Honolulu 33-5 Igoe & Smith, flowed 1,023 bbl. through 2½-in. casing outlet, acid, pay 4,940 ft., T.D. 5,042 ft.

Magnolia 1-A C. S. Dean, flowed 317 bbl. through 3-in. casing outlet after acid, pay 4,930 ft., T.D. 4,980 ft.

Magnolia 11-A Mallett, flowed 1,140 bbl. through 3-in. casing outlet, acid, pay 4,965 ft., T.D. 5,032 ft.

Magnolia 15-A Mallett, flowed 1,563 bbl. through 3-in. casing outlet, acid, pay 4,980 ft., T.D. 5,042 ft.

Magnolia 8-B Mallett, flowed 1,692 bbl. through 3-in. casing outlet, acid, pay 4,940 ft., T.D. 5,015 ft.

Texas 2-F Mallett, flowed 2,087 bbl. through casing, acid, pay 5,026 ft., T.D. 5,061 ft.

Slaughter, Hockley County: Honolulu 30-B Mallett, flowed 1,094 bbl. through 2½-in. casing outlet, acid, pay 5,001 ft., T.D. 5,038 ft.

Magnolia 20-A Mallett, flowed 1,164 bbl. through 3-in. casing outlet, pay 4,980 ft., T.D. 5,040 ft.

Magnolia 17-B Mallett, flowed 665 bbl. through tubing, acid, pay 4,945 ft., T.D. 5,025 ft.

Magnolia 3 Owne Heris, flowed 1,629 bbl. through 3-in. casing outlet, pay 4,930 ft.

Texas 2 Hudgens, flowed 525 bbl., acid, 4 per cent b.s. and w., pay 4,982 ft., T.D. 5,035 ft., P.B. 5,011 ft.

Texas 5-C Mallett, flowed 621 bbl. through casing, acid, pay 5,012 ft., T.D. 5,033 ft.

Texas 100 Slaughter, flowed 1,736 bbl. through casing, acid, pay 4,970 ft., T.D. 5,023 ft.

Texas 104 Slaughter, flowed 1,824 bbl. through casing, acid, pay 4,925 ft., T.D. 5,023 ft.

Texas 105 Slaughter, flowed 1,355 bbl. through casing, acid, pay 4,975 ft., T.D. 5,030 ft.

Texas 111 Slaughter, flowed 1,475 bbl. through casing, acid, pay 4,950 ft., T.D. 5,023 ft.

Wasson, Yoakum County: American Liberty 2 Carpenter, flowed 1,119 bbl. through tubing, acid, pay 5,046 ft., T.D. 5,180 ft.

Drilling & Exploration 8-C Hudson, flowed 541 bbl. through ⅝-in. tubing choke, acid, pay 4,900 ft., T.D. 5,125 ft.

Reagan County Deep Pool Extended Southeast

The Barnhart Ellenburger lime pool of southeastern Reagan County was extended 1½ miles east and a little south by Amerada Petroleum Corp. 1-RD University, Section 1, Block 48, University lands. The extensioner flowed 73 bbl. of oil in 6½ hours natural through ⅜-in. tubing choke. After treatment with 5,000 gal. of acid, it flowed 465 bbl. in 19 hours through ½-in. tubing choke. Oil tested 45.3 gravity, gas-oil ratio tested 1,774 : 1, and shut-in pressure on casing was 1,050 lb. and 650 lb. flowing pressure on tubing. The total depth was 9,228 ft. in Ellenburger lime.

The company, which controls the surrounding acreage, had three other wells drilling and had staked another at week's end. Newest test was 1-RF University, NW NE 10-48-U, ½ mile southeast of 1-RD University.

Amerada 1-A-RC, 4-48-U, between the 1-RD University and the discovery well, was drilling below 6,164 ft. in shale; 1-RE University, 9-48-U, 1½ miles southeast of 1-RB University, second producer for the field, was drilling below 3,871 ft., also in shale.

Abell Pool Extended West

The Abell Ordovician pool of northern Pecos County was extended one location west on the southwest edge of the pool by Magnolia Petroleum Co. 5 Silverman, 5-3-H.&T.C. Survey. The extensioner was completed for a daily potential of 681 bbl. a day through ½-in. choke. Oil tested 42.2 gravity and the gas-oil ratio was 719 : 1. Pay was from 5,952-61 ft.

SOUTHERN WEST TEXAS COMPLETIONS

(24-hr. rating based on last 3 hr. of 6-hr. gage)

Wildcats

Pecos County: Magnolia 1 Ella C. Price, dry, base Permian and top Pennsylvanian 4,735 ft., Ellenburger 5,200 ft., T.D. 5,506 ft.

Terrell County: Skelly 1 Ross L. Roberts, dry, T.D. 3,940 ft. in sand and shale.

Fields

Abell, Pecos County: Magnolia 3 Baldwin-State, flowed 151 bbl. natural through ½-in. tubing choke, Simpson 4,945 ft., Waddell 5,770 ft., pay 5,796 ft., T.D. 5,805 ft.

Barnhart, Reagan County: Amerada 1-RD University, flowed 465 bbl. in 19 hr. through ½-in. tubing choke, gravity 45.3, gas-oil ratio 1,744:1, base black shale 8,976 ft., top Ellenburger 9,038 ft., perf. 9,080-9,155 ft., pay 9,098 ft., T.D. 9,229 ft., P.B. 9,164 ft., *extension.*

Emperor, Winkler County: Sam Weiner 1 S. M. Halley, flowed 288 bbl. through ¾-in tubing choke, pay 3,000 ft., T.D. 3,187 ft., shot.

Johnson, Ector County: Sinclair Prairie 2-E Dora Johnson, flowed 984 bbl. through tubing, shot, pay 4,084 ft., T.D. 4,143 ft.

Sinclair Prairie 34-A Johnson, dry, T.D. 4,345 ft., P.B. 4,203 ft.

Jordan, Ector County: E. E. Folgerson 4-A University, flowed 325 bbl. through tubing, shot, pay 3,415 ft., T.D. 3,650 ft.

Keystone, Winkler County: S. W. Richardson 2-B Keystone, flowed 342 bbl. through 1-in. tubing choke, shot, pay 3,430 ft., T.D. 3,525 ft.

Richardson & Bass 1-B Ben Jenkins, flowed 312 bbl. through tubing, shot, pay 3,244 ft., T.D. 3,404 ft.

North Cowden, Ector County: Texas 21 Holt, pumped 386 bbl. after shot, pay 4,450 ft., T.D. 4,750 ft.

T. P. Coal & Oil 1 O. B. Holt, flowed 2,409 bbl. natural through 3-in. casing outlet, pay 4,510 ft., T.D. 4,730 ft.

Pecos Valley, Ward County: H. I. Waid 7 Brown heirs, flowed 59 bbl. through ¾-in. choke, shot, pay 1,814 ft., T.D. 1,886 ft.

Sand Hills Permian, Crane County: Humble 7-C Tubb, flowed 340 bbl. through 21/64-in. choke, pay 4,365 ft., T.D. 4,591 ft.

Waddell, Crane County: Gulf 51 Waddell, pumped 168 bbl. afted shot, pay 3,270 ft., T.D. 3,390 ft.

TEXAS PANHANDLE COMPLETIONS

Gray County: Gulf 19 Faulkner-A, Sec. 27-B-2 H.&G.N. Sur., pumped 280 bbl., pay 2,795-2,930 ft., T.D. 2,930 ft.

Smith Brothers 3 Castleberry, Sec. 115-3-I.&G.N. Sur., pumped 254 bbl., shot 3,208-83 ft., pay 3,210-80 ft., T.D. 3,283 ft.

Texas 38 G. H. Saunders, Sec. 12-A-6 H.&G.N. Sur., pumped 206 bbl., shot 2,849-2,921 ft., pay 2,875 ft., T.D. 2,921 ft.

Hutchinson County: Danube Oil 14 Sanford-A, Sec. 78-46-H.&T.C. Sur., pumped 249 bbl., pay 2,805-26 ft.

Huber 3 Weatherly, old well, old T.D. 2,690 ft., T.D. 3,027 ft., new pay 2,950-3,027 ft., tested 558 bbl.

Dave Ruben 1-A Whittenburg, Sec. 33-47-H.&T.C. Sur., pumped 40 bbl., pay 2,817-48 ft., acid, T.D. 2,851 ft.

Dave Ruben 1 Merchant-A, Sec. 32-47-H.&T.C. Sur., pumped 10 bbl. oil, 2 per cent water, acid, pay 2,757-80 ft., T.D. 2,790 ft.

Moore County: Shell and Sinclair 1 T. G. Smith, Sec. 132-3-T T.&N.O. Sur., gaged 4,900,000 cu. ft. gas, R.P. 373 lb., pay 3,060-3,234 ft., acid, T.D. 3,234 ft.

SOUTHEAST NEW MEXICO COMPLETIONS

Lea County

Semiwildcat: Cities Service 2 Jewitt-McDonald, SE SW SW 17-20-34, dry, T.D. 3,633 ft. in lime, anhydrite 1,470 ft.

Arrowhead: Repollo Oil 3 Brownlee, SW NW SW 25-21-36, flowed 85 bbl. in 6 hr., pay 3,800 ft., T.D. 3,845 ft., acid.

Eunice: Wilson Oil 7 State, NE SW 13-21-34, flowed 60 bbl. in 12 hr., 35 gravity, pay 3,740 ft., T.D. 3,795 ft., shot.

Rhodes: Krupp & Flaherty 2-C Moberly, SW SE 21-26-37, 6,100,000 cu. ft. sweet gas, 3,103 ft., T.D. 3,348 ft.

OKLAHOMA FIELD REPORT

Recompletions and Workovers Keep Activity Near Normal

By CARL HOOT

FIELD operations in Oklahoma over the past week were running near normal, although a good part of the activity was due to recompletions or workovers. Of the 21 oil wells, only 3 were good producers. These were the Mid-States 2 Nadean in the Hotulke pool of Pottawatomie County, flowing 273 bbl.; C. C. Peppers 1 Streitberger, Oklahoma City pool, which flowed 423 bbl. from Wilcox, and in Osage County A. G. Oliphant 2 Osage pumped 200 bbl. from the Wilcox sand. A gas well of 6,000,000 cu. ft. daily was added to the south end of the Lovel pool in Logan County with the completion of Devon Oil Co. 2 Harmon.

Apache Pool Gets Sixteenth Producer

Texas Co. 3 Mulkahay, SW NE SE 2-5-12w, Caddo County, was nearing completion after drilling 3,900 ft. in the Bromide-Wilcox sand. The well flowed 144 bbl. of oil through open tubing.

Cleveland County Wildcat Coring

In Cleveland County, Phillips Petroleum Co. 1 Heenan, SE NE SE 6-8-1, cored sandy dolomite and white sand at 6,797 ft. Total depth is 6,822 ft. in hard white sand.

Southwestern Oklahoma Wildcat Promising

Culham Petroleum Co. 1 Stone, NE NE NE 4-3s-17w, southeast of the Frederick pool in Tillman County, was drilling below 4,000 ft. and heading for the Arbuckle lime. The well is reported to be one of the most promising wildcats in southwestern Oklahoma and should the Arbuckle be unproductive, it may be plugged back to shallower zones where core samples have indicated possible commercial production.

Okfuskee County Wildcat May Be New Dutcher Sand Discovery

Doak & Hughes 1 Hensley, NW SE NW 21-13-9, a wildcat near Beidleman in north central Okfuskee County, which has been showing for a new Dutcher sand, swabbed 50 bbl. from sand at 3,180-09 ft. On last report, the well was cleaning out after a shot of 20 qt.

OKLAHOMA COMPLETIONS

Wildcats

Comanche County: Texas Co. 1 Reich, NW NW NE 25-4-11w, dry, T.D. 3,493 ft., sand 1,316 ft., McLish shale 2,035 ft., sand 2,207 ft., D.S. test 2,434-55 ft., recovered 120 ft. oily gas-cut mud, P.B. 2,485 ft., shot 2,435-70 ft.

Lincoln County: Helmerich & Payne 1 Harper, S½ SW NW 20-14-5, dry, T.D. 4,854 ft., Prue 3,664-3,710 ft., show oil, Woodford 4,510 ft., Hunton 4,554 ft., D.S. test 4,556 ft., recovered water, Sylvan 4,638 ft., Viola 4,736 ft., Simpson 4,770 ft., Wilcox 4,795 ft., second Wilcox 4,828 ft.

Osage County: Olson Drlg. 1 Osage, SW cor. 12-24-5, dry, T.D. 3,115 ft., Oswego 2,725-2,820 ft., Prue 2,909-14 ft., Mississippi lime 3,110-15 ft.

Norbia Drlg. 1 Osage, NW NW SE 6-24-6, dry, T.D. 2,887 ft., conglomerate sand 965 ft., Mississippi lime 2,872 ft., Mississippi chat 2,877 ft.

Payne County: H. L. Berkey 1 Frick, S½ SW NW 33-19-2, dry, T.D. 4,874 ft.

Seminole County: Simpson-Fell 1 Riplogle, NE NE NW 34-10-8, dry, T.D. 3,554 ft., sands 2,960 ft., 3,227 ft., 3,540 ft.

Fields

Ada, Pontotoc County: Bishop Oil 1 Haney, NW SW NE 15-4-6, pumped 30 bbl., sand 802-16 ft.

Cromwell, North, Okfuskee County: C. W. Titus 1 Jackson, NW NW 25-11-8, dry, T.D. 4,008 ft.

Cromwell, South, Seminole County: Mico 1 Rogers, SW NE SE 33-10-8, 7 bbl., sand 2,113-44 ft., T.D. 2,176 ft.

Dill, Okfuskee County: J. J. O'Laughlin 2 Keyes, N½ NE SW 11-11-8, pumped 5 bbl., Cromwell 3,430 ft., T.D. 3,969 ft.

Pace & Marshall 1 Key, NE SE SW 11-11-8, dry, T.D. 3,476 ft., old T.D. 3,443 ft.

Dilworth, Kay County: C. A. Leonard 1 Hitch, NE NE SW 19-28-1, pumped 70 bbl., Wilcox 3,314-44 ft.

Earlsboro, South, Seminole County: Eason Oil 2-A Anderson, SE NW NE 22-9-5, pumped 17 bbl., Earlsboro 3,418-35 ft.

Fitts, West, Pontotoc County: Roodhouse 1 Hunter, N½ SW NE 28-2-6, pumped 75 bbl., pay 3,278 ft., T.D. 3,304 ft.

Hobart, Kiowa County: Argo Oil 4 Ratliff, NW NE NE 19-7-17w, pumped 18 bbl., 1,210-1,685 ft., T.D. 1,831 ft., old T.D. 1,210 ft.

Hotulke, Pottawatomie County: Ohio 1 Sandefur, NW NW NE 21-9-4, dry, T.D. 4,830 ft.

Ohio 2 Billington, SE SW SE 22-9-4, pumped 52 bbl., Viola 4,344 ft.

Mid-States 2 Nadean, NE NE 25-9-4, flowed 273 bbl., Hunton 4,088-96 ft., T.D. 4,330 ft.

Lovell, Logan County: Devon Oil 2 Harmon, NE SE 33-18-4w, 6,000,000 cu. ft. gas, Elgin sand 3,380-3,400 ft., T.D. 4,112 ft.

Okemah, Okfuskee County: Deep Rock 2 Camp, NE SW NW 20-11-9, dry, T.D. 3,455 ft.

Oklahoma City, Oklahoma County: C. C. Peppers 1 Streitberger, NW SW SW 27-12-3w, 423 bbl., Wilcox 6,511-55 ft.

Pearsonia, Osage County: C. A. Klauder et al 4 Osage, NE NW NE 19-27-8, pumped 5 bbl., Mississippi chat 2,362-2,444 ft.

St. Louis, Pottawatomie County: Iglehart 1-B Phillips, NW SW NE 4-6-5, dry, old T.D. 4,168 ft., P.B. 3,057 and 2,880 ft., hole full of oil and water, swabbed down, then swabbed all water.

Alma Oil 1 Smith, SE SE NE 32-7-5, punped 50

(Continued on Page 86)

P-11

Two Le Roi D471 valve-in-head engines driving Kobe pumps on property of a major oil company in Three Sands Field, Tonkawa, Okla.

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NORTH LOUISIANA, ARKANSAS

Midway Field Defined Except In Southeasterly Direction

SHREVEPORT, La.—Carter 2-D Tensas Delta, 25-6n-3e, the second well in the Sandy Bayou area of La Salle Parish, was not abandoned at 4,543 ft., but is now conditioning mud to drill ahead. The first well, also drilled by Carter, was a producer.

In Avoyelles Parish, H. L. Hunt 1 Thompson & Katz, wildcat located SW NW 4-2n-5e, near Marksville, is drilling ahead at 6,848 ft.

The record deep test for North Louisiana, Union Producing Co. 1 McDonald, located in 13-21-5, Claiborne Parish, north of the Lisbon field, continues to drill ahead at 12,439 ft.

NORTH LOUISIANA COMPLESTIONS

Wildcats

Claiborne Parish: C. C. Smyer et al 1 Kennedy Est., SE SW 9-22n-4w, dry, T.D. 3,004 ft.

Fields

Caddo, Caddo Parish: Kennedy & Bacheller 10 Muslow Oil Co., NW NW 5-20n-15w, location abandoned.
F. L. Kyle 1 Thigpen-Herold, NE NW 10-21n-16w, 35 bbl. oil, 10 bbl. water, 2,401 ft.
Transport Oil Co. 8 Crystal fee, NE SE 24-21n-16w, 25 bbl. oil, 1,008 ft.

Haynesville, Claiborne Parish: Arkansas Fuel Oil B-7 DeLoach, NE SW 22-23n-8w, 605 bbl. oil, 5,380 ft.
W. B. Hinton et al 1 S. T. Hunt, SW SE 16-23n-8w, 647 bbl. oil, 5,365 ft.

De Soto-Red River, De Soto Parish: E. L. Kistler and H. M. Creighton 1 Mathews Est., SW SW 29-12n-11w, dry at 2,711 ft.

Nebo, La Salle Parish: H. L. Hunt A-44 Goodpine, SE SE 3-7n-3e, 90 bbl. oil, 10 bbl. water, 4,123 ft.
H. L. Hunt F-79 Goodpine, NE SW 22-7n-3e, 100 bbl. oil, 5 bbl. water, 4,100 ft.
H. L. Hunt F-83 Goodpine, SE SE 21-7n-3e, 107 bbl. oil, 9 bbl. water, 4,150 ft.
Ruth Mears Nichols 1 Wilson-Paul, SW NW 22-7n-3e, 120 bbl. oil, 4,039 ft.

NEW WILDCAT LOCATIONS

Natchitoches Parish: George H. Echols 1 Goodpine, NE NE 13-13n-8w.

Midway Field Activity

The J. I. Roberts 1 E. S. Bond, NE SW 11-15s-24w, a direct east offset to the discovery well in the new Midway field of Lafayette County, Arkansas, flowed 792 bbl. of oil after being perforated from 6,375 to 6,400 ft. with 100 shots. This makes the third successful producer in this area. Porosity was topped at 6,338 ft., which is approximately 100 ft. higher than in the west and north offsets. Leasing activity has spread eastward, and it is reported to have reached the northeastern flank of the Monroe gas field in North Louisiana.

Barnsdall 2 B. H. Dobson et al, SW NW 11-15s-24w, perforated casing from 6,450 to 6,500 ft. with 200 shots, the well flowed 24 bbl. per hour on ½-in. tubing choke, 65 per cent b.s. and w., tubing pressure 125 lb., casing pressure 500 lb. These perforations were squeezed off and the well was reperforated from 6,450 to 6,460 ft. with 40 shots, now testing.

Frank and George Frankel 1 J. H. Burns, NW NE 10-15s-24w, northwest of Barnsdall 1 Dodson, flowed 26 bbl. of oil per hour through tubing choke. Barnsdall 3 Bond, SW SW 11-15s-24w, flowed 27 bbl. of oil per hour through tubing choke. Smackover lime was topped at 6,477 ft., first porosity 6,491 ft., second porosity 6,502 ft.

P. R. Rutherford 1 Stamps Land Co., SE SW 3-15s-24w, had porous lime at 6,572 ft., but was abandoned at total depth of 6,579 ft.

ARKANSAS COMPLESTIONS

Big Creek, Columbia County: J. W. Love 1 Stager unit, C NE 9-17s-21w, 55 bbl. cond., 1,000 M.c.f., 7,988 ft.
Midway, Lafayette County: Arkansas Fuel Oil 1 Creek, NE SE 10-15s-24w, 430 bbl. oil, 34.9 gravity, 6,494 ft.
Magnolia Pet. Co. 1 J. A. Johnston, NE NW 11-15s-24w, dry at 6,584 ft.
J. I. Roberts 1 E. S. Bond, NE SW 11-15s-24w, 792 bbl. oil, 6,375 ft.
Smackover, Ouachita County: C. W. Bibby 5 Hardin, SW SE 28-15s-16w, 10 bbl. oil, 50 bbl. water, 2,009 ft.

Mississippi

A wildcat well was staked in Yazoo County by W. O. Allen and Hassie Hunt in the C NW NW 32-11n-2e, which is the 1 A. J. Pickett. Operators are now rigging up.

Phillips 1 Whitworth, SE NW 4-11n-3e, Madison County, are shut down at 664 ft. on account of high water. It is reported that operators will probably start coring as soon as operations can be resumed. In this same county Phillips 1 Gene, SW SE 4-11n-3e, total depth 4,910 ft., pumped 113 bbl. oil in 24 hours, no water test. Formation tops: Tallahata 904 ft., Wilcox 1,233 ft., Midway 3,077 ft., Clayton 3,863 ft., Selma 3,912 ft., base hard chalk 4,288 ft., top Eutaw 4,812 ft., Wilburn 4,849 ft.

Florida

In Wakulla County, Lloyd Brown and Ravlin have made location for a wildcat, 1 V. G. Phillips, to be drilled in the NW NW 14-3s-1e.

(Continued on Page 86)

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2-42

SOUTHWEST TEXAS

Four Scattered Wildcats Log Favorable Showings

By F. L. SINGLETON

CORPUS CHRISTI, Tex.—The Southwest Texas district had promise of several new pools as four wildcats located in Refugio, Nueces, Jim Wells, and Hidalgo counties logged favorable showings of oil or gas.

Four miles southwest of the La Rosa field, Refugio County, Hewitt & Dougherty 6-A Rooke, J. M. Aldrite Survey, Block 28, tested 450 lb. working pressure and recovered 15 gal. of distillate on a 5-minute drill-stem test at 6,595-7,007 ft., while another drill-stem test at 7,060-80 ft., tested 475 lb. working pressure and recovered 20 gal. of distillate. Additional sand was cored at 7,120-29 ft., the total depth, and this section was being drill-stem tested at the end of the week. The company has drilled several wells in this particular area which is believed to be on an entirely separate structure from that of the La Rosa field which produces from a series of sands in the Frio section at intervals from 5,300-6,300 ft.

Good Oil Show Logged Northeast of Driscoll

Five miles northeast of the Driscoll townsite, Crown Central Petroleum Co. and Kepley Production were preparing to run casing in 1 J. Y. Womack, preparatory to testing sand logged by an electrical survey from 6,276-88 ft. Side-wall cores of this 12-ft. interval showed it to be firm, clean sand with a good show of oil. This is the only sand to be logged in the well which was drilled to a total depth of 7,510 ft. The well is located in Section 9 of the Roberts & White subdivision of the Hoffman Petronilla ranch. Based on an electrical survey made at 6,000 ft., the well was 170 ft. higher than Sun 1 Klosterman, and about flat with Diadem Oil Co. 1 Mayo, both dry holes.

Bruce Baxter 1 Koopman, a wildcat located 3½ miles southwest of the Springfield townsite, Jim Wells County, showed promise of production, but is being retested due to salt-water intrusion. Drilled to a total depth of 6,016 ft., the well was tested through perforated casing at 5,115-22 ft., and flowed at the rate of 4 bbl. of fluid per hour, 15 per cent of which was 43-gravity oil and 85 per cent wash water through a 7/64-in. choke. Tubing pressure was 75 lb., and casing pressure 355 lb. At the end of 20 minutes, the pressure dropped to 15 lb., and the well began to show salt water which increased to 100 per cent and the well then went dead. At the end of the week, the perforations had been squeezed off, and another test was scheduled to be made of the same interval. It is the opinion of the operator that the salt water is due to a bad cement job.

Operators interested in the Seeligson field, Jim Wells County, were watching the outcome of a scheduled production test of Magnolia 28 Seeligson which may open a 1-mile north extension to the field. With the hole bottomed at 7,461 ft., 7-in. casing was cemented at 6,168 ft., preparatory to testing sand at 6,080-6,130 ft. that showed favorable indications on an electrical survey. The well is reported to have checked structurally low to wells in the field proper, and in view of the fact that no other sands were reported to be logged, the well appears to be located near the edge of the structure.

Another gas-distillate field is believed to be in the making as Davenport and Lockhart 1 Sweeney, a wildcat located 6 miles southwest of Donna, was drilling in shale below 5,770 ft., after coring a gas-distillate sand at 5,742-50 ft. An electrical survey was made of the section, but the results were not available. The well is located in the El. A. D. Gato grant in Blocks 3 and 5 of the Wayne Woods Subdivision 2.

South Caesar Field Undergoing Development

Additional development was being started in the new South Caesar field, Bee County. Tom Slick, Jr., began moving in material for 2 Grissom, about ½ mile south of his discovery well in the W. W. Gant Survey, while Jay Simmons announced location for 1 Ulee Cotton, about 1 mile east of the discovery well in the T. Powell Survey. Both wells will be drilled in search of the Carrizo sand which produces in the discovery well just below 6,600 ft. South of the Pettus field and about 2 miles north of the West Tuleta field. Tide Water Associated Oil Co. leased 700 acres of the Imogene Hall land, centering in the J. W. Williamson and F. Martin surveys, and the com-

(Continued on Page 87)

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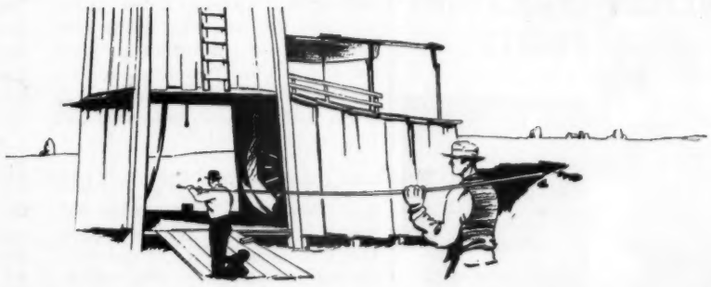

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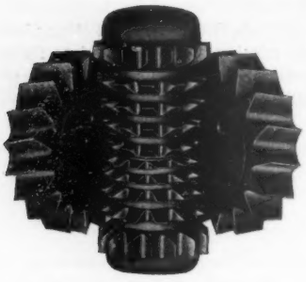

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Among the Drilling

DAN McQUEEN & SON, drilling contractors of Winchester, Ky., have started operations on a wildcat for themselves and others on the C. D. Williams farm in Menifee County, Kentucky, on the waters of Beaver Creek, and adjacent to the town of Frenchburg, the county seat. A Clinton test is the goal if the Corniferous should fail to produce.

MARTIN THOMPSON, Houston. Tex., received contract from Tide Water Associated Oil Co. for 2 G. W. Armstrong, a wildcat about 4½ miles south of Needville in Fort Bend County, Texas., and a rig is being moved to the location.

C. C. GILGER, Houston, Tex., is moving his rotary in southern Cass County, Texas, to a location offsetting a new field discovery well completed by the contractor recently for John Messenger, Bob Whalen et al. The producer drilled by Mr. Gilger is 5 miles west of the southwestern wells in the Rodessa field and 4 miles north of the Lodi district. Production from the Glen Rose lime is coming from around 6,000 ft. W. C. Windsor of Tyler, Tex., owns acreage calling for a south offset. Texas Co. and Phillips Petroleum Co. are equal owners in the discovery well along with Messrs. Messenger and Whalen.

HANNUM Drilling Co., Wichita, Kans., has moved rotary to the Berscheidt lease, CWL NW NW 25-19-12w, 1 mile north of the discovery well of the Hammer field, Kansas.

COMMERCIAL Drilling Co., Tulsa, is building derrick and preparing to rig up rotary for Fred T. Haddock 1 Phillips, a semiwildcat test, SW NW NE 8-9-6e, 2 miles northwest of Carter Oil Co.'s camp, in the East Earlsboro area, Seminole County, Oklahoma. Contract calls for testing the Wilcox sand which is expected around 4,200 to 4,300 ft.

VICTORY Drilling Co., Jackson, Miss., has moved rotary rig to location on the J. J. Newman Lumber Co. land in Perry County, Mississippi, where a wildcat will be drilled in the C NW SE 21-1s-9w. Contract calls for drilling to 8,500 ft., which is expected to carry the hole into the marine sand of the Tuscaloosa.

ROWAN Drilling Co., Fort Worth, Tex., is moving a rotary rig to northwestern Yoakum County, Texas, where obligation has been assumed to drill a 5,500-ft. wildcat test 1 mile south of the Cochran County, Texas, line and 2 miles east of the Lea County, New Mexico, line. Location is in the NE cor. Section 46, Block D, John H. Gibson Survey.

HOLLOW Drilling Co., Wichita, Kans., has opened an operating office at Oklahoma City, Okla. Katherine Manton is listed as the Oklahoma agent of the company in its foreign charter.

PORTABLE Drilling Co., Tulsa, has taken contract for a 5,000-ft. well on school land in Payne County, Oklahoma. Location is in SW NE NE 36-18n-1e, near Coyle and southwest of the Ramsey field.

BRUNSON Drilling Co., Wichita, Kans., has spudded a wildcat well for Union Oil Co. on the Ringwald lease, CWL NE NW 32-18-10w, 2

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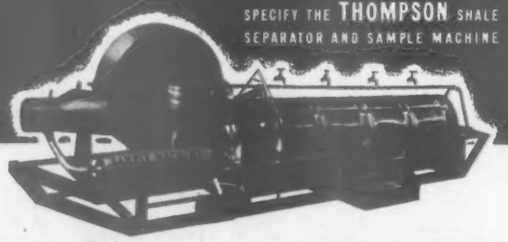

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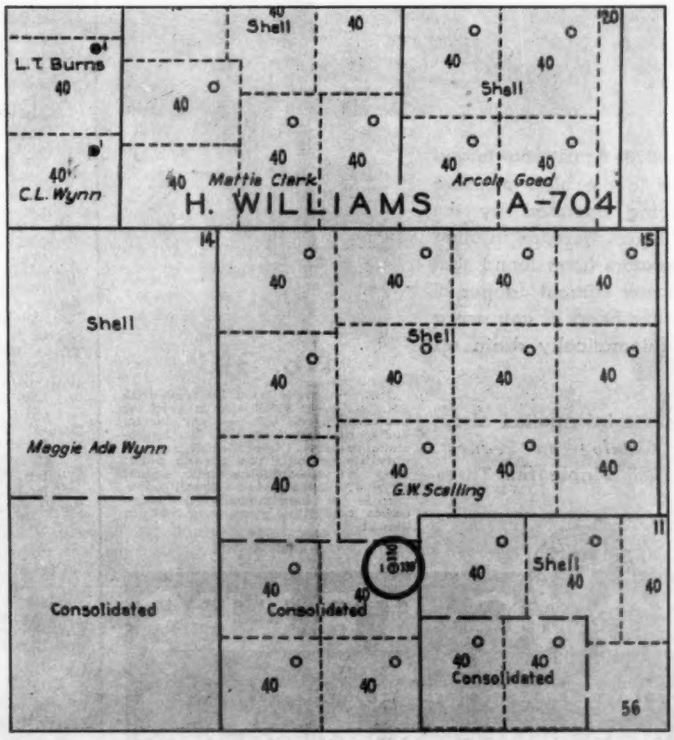
miles northeast of the Brandenstein field in Rice County, Kansas.

BERT FIELDS, Dallas, Tex., contractor, is drilling at a shallow depth on a Woodbine wildcat test southwest of production in the Flag Lake field in west Henderson County, Texas. Topaz Oil Co. is associated with the contractor in the operation which is on the May farm, Tarkington Survey.

SUMMIT Drilling Co., Tulsa, has started operations on a wildcat test for Richard Hughes, geologist, on the Gregg farm, SE NE SE 13-11-7e, Seminole County, Oklahoma.

Approval of Spacing Patterns Is Returning Some Tools to Service

DRILLING CONTRACTORS in North Texas, as well as in other parts of the country, were beginning to put their tools back to work last week as approval of spacing patterns for new pools began coming through. One of the new pools for which a spacing pattern had been submitted and approved by the Texas Railroad Commission (in accordance with requirements of Conservation Order M-68) was the new Joy pool in southern Clay County. The open circles are tentative locations to be drilled only if production is found nearby. Locations were put in the northeast corner of each 40-acre tract, in the same geographical position as the discovery well. While operators agreed to this pattern, they were not required to consider location of the discovery in laying it out since that well (Consolidated 1 C. L. Wynn, an old abandoned wildcat deepened last fall from 5,204 ft. to Mississippian lime at 4,890-5,967 ft., initial flow 76 bbl. in 3 hours through 1/64-in. choke) was drilled before December 23, 1941. First well to be drilled on the approved pattern will be a wildcat, Consolidated 1 G. W. Scaling (circled), contracted to 6,000 ft. by John Harris of Wichita Falls. Mr. Harris was rigging up rotary on the location last week.



This location grid shows how the operators in the Joy field, Clay County, Texas, have complied with spacing regulations in M-68

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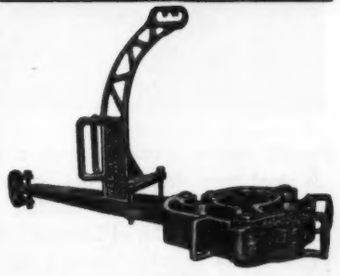
RECTORSEAL comes to the user in liquid form, and when applied with a brush or swab, it quickly forms a plastic, elastic mass which seals and holds the seal indefinitely. Due to its natural lubricating quality, RECTORSEAL will not "freeze" on the line.

Your supply store has RECTORSEAL. Ask for it by name.

RECTORSEAL
THE POSITIVE LEAK PREVENTER

WEB WILSON
Rotary Tongs



THEY REPORT

"To our men there are no other Tongs made but WEB WILSON."

So say the tool pushers where WEB WILSON Tongs are run. Convenience means speed. Speed means dollars in the Contractor's pocket. Few parts, quickly changed, cover the entire tong range. No waiting for heads to come from the tool rack.

Easy for the new rough neck to learn to operate. Easier on the old operator. Save their cost many times over. See pages 2449 to 2454, Composite Catalog for 1942.

WEB WILSON
Oil Tools
W. W. WILSON BUILDING
HUNTINGTON PARK, CALIF.

Harper County Test Shows Oil in Kansas City Lime

By CARL HOOT

WHILE the number of completions reflected the lull which has prevailed since the start of the year, an increase in drilling is indicated by the 27 first reports for the week. Twenty-five wells were completed for the week, of which 13 were producers with a total potential of 15,008 bbl. Sixteen oil wells were completed the previous week with production of 14,784 bbl.

Harper County Wildcat Has Show of Oil

Seventeen miles northwest of the Caldwell pool of Sumner County, nearest production, H. M. Williams 1 Lahman, C NW SE 1-34-6w, topped the Lansing-Kansas City lime at 3,770 ft. Operators reported showings of oil from 3,770-79 ft. A 5-ft. core recovered from 3,773-87 ft. showed 50 per cent saturation. Drill pipe stuck while the crew was preparing to run a drill-stem test and when last reported, operators were recovering the stuck pipe preparatory to setting packer at 3,763 ft. Regional high position of the well on top of the Kansas City lime indicates a local substructure. The area was originally core drilled by Carter Oil Co. in 1926, which revealed a local feature, a northwest to southeast major axis.

Makes Steam Drilling Rig Engines Work Better!

THE above picture shows a No. 313 Armstrong forged steel trap draining the separator in the high pressure steam line feeding a drilling engine operated by the Roberts Drilling Co. of League City, Texas. Here, as in other parts of the country, drilling rig operators have found that you can push engines harder and faster without danger of having a slug of water burst a cylinder head IF you use a separator and Armstrong trap to automatically drain all condensate in the steam line.

We will be glad to send complete information about traps for this kind of service. *Catalog on request.* ARMSTRONG MACHINE WORKS, 868 Maple St., Three Rivers, Mich.

No. 313

This is the size used by most drillers. It lists at $56.00 and is good for pressures up to 600 lbs. per sq. in. Bodies are tested at 3000 lbs. hydrostatic pressure. Operation is remarkably simple—only two moving parts. Trap is self-scrubbing and cannot air-bind. There are no small openings to get clogged easily—the valve orifice for 350 lbs. pressure is 5/32" in diameter.

ARMSTRONG TRAPS

Automatic Drainage for

REFINERIES · GAS PIPE LINES · DRILLING RIGS

KANSAS COMPLETIONS

Wildcats

Decatur County: Phillips Petroleum 1 Vernon, NE NE 32-3-28w, dry, T.D. 4,400 ft., anhydrite 2,425 ft., Lansing 3,751 ft., Topeka 3,603 ft., base Kansas City 3,969 ft., Viola 4,230 ft., Simpson 4,268 ft., Arbuckle 4,276 ft., granite 4,394 ft.

Jefferson County: Sherrod & Workman 1 Seitz, SW NE 32-10-19, dry, T.D. 1,643 ft., Mississippi lime 1,625 ft.

Rooks County: Cities Service 1 Conger, NE NE NW 22-10-16w, about midway between Kruse and Bemis-Shutts pools, dry, T.D. 3,689 ft., Lansing 3,208 ft., good porosity and light stain 3,322-25 ft., base Kansas City 3,510 ft., Arbuckle 3,639 ft.

Stafford County: Adair & Morton 1 Roberts, N½ NE NE 14-21-12w, dry, T.D. 3,667 ft., P.B. 3,380 ft., perf., recovered 2 bbl. water and show of oil, Topeka 2,795 ft., Lansing 3,228 ft., base Kansas City 3,463 ft., Simpson shale 3,505 ft., Arbuckle 3,553 ft.

Hinkle & Texon 1 Harper, SW NW NE 11-24-13w, northeast of St. John pool, dry, T.D. 3,919 ft., Lansing 3,520 ft., Viola 3,881 ft., stain 3,894-96 ft.

Fields

Beaver, Barton County: Vickers Petroleum 2 Kerr, S½ SW SE 15-16-12w, dry, T.D. 3,390 ft.

Bedford, Stafford County: Stanolind 1-B Allen, NW NW SW 27-23-12w, 3,000 bbl., Arbuckle 3,829-39 ft.

Bemis, Ellis County: Deep Rock 37 Baumer, E½ SE SW 27-11-17w, 3,000 bbl., Arbuckle 3,570 ft., T.D. 3,585 ft.

Cunningham, Pratt County: Drillers Gas 1 Fitzsimmons, E½ SW NW 35-27-11w, 845 bbl., Lansing 3,468-3,514 ft., T.D. 3,596 ft.

Dayton, Phillips County: Carter Oil 2 Eltiste, NE NE 35-2-19w, 124 bbl., Lansing 3,168-3,348 ft., T.D. 3,368 ft.

Dopita Rooks County: Sharon Drlg. 1 Maddy, E½ NE NW 36-8-18w, 24 bbl., worked over Lansing 3,136-3,400 ft., T.D. 3,528 ft.

Fairport, Russell County: Stuart 1-A Dodge, S½ SE SW 29-11-15w, 110 bbl., Lansing 2,967 ft., T.D. 2,983 ft.

Gideon, Russell County: Earl Wakefield 1 Phinney, E½ SE NE 5-15-14w, dry, T.D. 3,253 ft.

Heiken, Ellsworth County: Appleman 1-B Stratman, N½ NW NW 24-17-10w, 231 bbl., Arbuckle 3,212 ft., T.D. 3,228 ft.

Hower, Cowley County: Arthur Brewer 1 Coulson, SE SE SW 33-33-3, 25 bbl., Bartlesville 3,323-35 ft., T.D. 3,337 ft.

Kraft-Prusa, Barton County: Sinclair 3 Oeser, N½ NE SW 17-16-11w, 422 bbl., Arbuckle 3,302-12 ft.

Black-Marshall Oil 2 Grossardt, SW NE NW 4-17-11w, 2,730 bbl., Arbuckle 3,299 ft., T.D. 3,314 ft.

Shell 1-B Soeken, NE cor. 21-17-11w, 3,006 bbl., Arbuckle 3,269 ft., T.D. 3,277 ft.

Lorraine, Ellsworth County: J. Glenn 1 Mohney, NE SE SE 14-17-9w, 10 bbl., Lansing 3,045-55 ft., T.D. 3,199 ft., P.B. 3,195 ft.

J. Glenn 4 Mohney, NE SW SE 14-17-9w, 10 bbl., Lansing 3,045-55 ft., T.D. 3,187 ft., P.B. 3,060 ft.

Max, Stafford County: Stanolind 1 Wolf, W½ NW NE 1-22-12w, 403 bbl., Lansing 3,363-68 ft., T.D. 3,651 ft.

Raymond, Rice County: Skelly 4 Graham, SE NE SE 16-20-10w, dry, T.D. 3,372 ft., P.B. 3,257 ft.

Roxbury, East, McPherson County: Texas 1 Toile, S½ SW SE 16-17-1w, 701 bbl., Mississippi lime 2,653-62 ft.

Trapp, Russell County: Phil-Han Oil 1 Karst, NE NE SE 22-15-14w, dry, T.D. 900 ft.

Westhusin, Rooks County: Co-Operative 1 McClay, E½ SW SW 12-9-17w, 302 bbl., Lansing 3,337-40 ft., old T.D. 3,280 ft.

Welch, East, Rice County: Aladdin Petroleum 1 Lackey, W½ SW SE 1-21-6w, 278 bbl., Mississippi lime 3,337-83 ft., old T.D. 3,366 ft.

Whelan, Barber County: Great Lakes Carbon 1 Whelan, NW NW 32-31-11w, dry, T.D. 4,354 ft.

Zenith, Stafford County: Tom Allen 1 Volker, SE SW 1-24-11w, 717 bbl., Viola 3,715 ft., T.D. 3,742 ft.

Miscellaneous

Jefferson County: Ed Jackson 1 Shugart, SW SW 6-9-20, T.D. 2,007 ft., Mississippi lime 1,521 ft.

Pryor & Lockhart 1 Varner, C E½ NE SE 11-11-19, dry, T.D. 1,515 ft., Mississippi lime 1,521 ft.

Leavenworth County: Roxana Oil Co. 1 Fisher, C N½ SE NE 19-11-22, dry, T.D. 1,630 ft., Viola 1,550 ft.

NEBRASKA

ST. JOSEPH, Mo.—Skelly Oil Co. now has 11 oil producers in the Barada pool of Richardson County, Nebraska. No. 2 Fred Merz, the latest,

(Continued on Page 87)

Rubber Restrictions Bring Back Horse-and-Buggy Days

MATTOON, Ill.—The horse and buggy returned to certain Illinois oil fields last week, replacing trucks and automobiles. Two major companies announced their oil-field foremen were being equipped with horses and buggies in Marion, Fayette and Hamilton counties in an effort to save tires for the duration. The appearance of the horse in the Illinois oil fields is indicative of a trend already noticed in some producing areas and which will probably be evident in most of the oil-producing states before many weeks.

Meantime, weekly surveys showed the state had only 177 operations in the week ended March 7, a decline of 6 from the previous week but little more than a third of the nearly 500 operations under way last December.

A total of 15 new producers were completed with initial output totaling 3,564 bbl. daily, and there were 9 dry holes.

White and Franklin Wildcats Recover Saturation

The Seaboard Oil Co. recovered saturation in wildcats in Franklin and White counties last week and both wells are near completion. The Franklin County well is the 1 U. S. Coal & Coke, SW SE 14-6s-4e, which is expected to open a new pool about 6 miles west of the Rural Hill field of Hamilton County. Operators set casing on the Cypress sand after a 45-minute drill-stem test, taken at 2,839-50 ft., recovered 200 ft. of free oil and 150 ft. of oil-cut mud. The test is bottomed at 2,855 ft.

The White County well was the 1 Henry Gates, SW NW SW 3-5s-9e, wildcat 2 miles northwest of Carmi. No. 1 Gates encountered saturation in the Aux Vases sand at 3,227-40 ft. and produced 150 ft. of oil and 50 ft. of oil-cut mud during a 30-minute drill-stem test of that formation. After 20 minutes, a flow of gas came in and the well was shut in with a gas pressure of 1,300 lb.

Meanwhile, Carter Oil Co. has completed its pool opener 1½ miles south of the Storms field, 1 E. A. Marlin, SW NW 35-6s-9e. Initial production was 80 bbl. of oil and 70 bbl. of water a day on pump from the Benoist at 2,797-2,807 ft. The well has been testing for several weeks in an effort to reduce the water.

North Simms Pool Extended

The Pure Oil Co. apparently has extended the North Simms pool of Berry Township, Wayne County, a short distance west. The company's 1 W. L. Reed, S½ SW SE 17-1s-6e, flowed after a drill-stem test was open 25 minutes in the McClosky lime. Casing has been set to 3,248 ft. and a production test is under way.

Shell Oil Co., Inc.'s deep test near Tamaroa in Perry County, L. J. Shubert, N½ SW SE 23-4s-2w, is shut down for repairs at 2,893 ft. The well is in the Devonian lime and has had one slight show in that formation. Perry County has no production at present but has four active wildcat tests.

ILLINOIS COMPLETIONS

Wildcats

Adams County: Ohio 1 G. Fingerlin, SE NW 26-2s-8w, dry at 675 ft., Hardin sand 255 ft., show oil 255-63 ft., Maquoketa 263 ft., St. Peter 666 ft.

Hancock County: W. C. Cain 1 Tobias, SW SW NW 24-4n-7w, dry at 865 ft., Mississippi lime 219 ft., Kinderhook 345 ft., Maquoketa 570 ft., Trenton 730 ft.

Jasper County: Pure 1 Ben Ochs, W½ NE NE 35-6n-10e, dry at 2,940 ft., Glen Dean 2,294 ft., Barlow 2,453 ft., Cypress 2,494 ft., Paint Creek 2,608 ft., Benoist 2,650 ft., Ste. Genevieve 2,775 ft., Rosiclare 2,790 ft., Fredonia 2,814 ft., St. Louis 2,907 ft.

Johnson County: McGee 1 Taylor, E½ SW SE NE 34-13s-4e, dry at 705 ft., Hardinsburg sand 155 ft., Golconda 235 ft., Cypress 356 ft., Cypress sand 460 ft.

Marion County: C. F. Frazier et al 1 Vangilder, SW SE SE 33-1n-2e, pumped 70 bbl., 5-qt. shot on bottom, Benoist 1,962-65 ft., T.D. 1,971 ft. *Dix extension.*

Wayne County: Wright 1 Snider, NE SE NW 26-6s-1e, dry at 2,836 ft., Menard 1,904 ft., Waltersburg 1,977 ft., Glen Dean 2,111 ft., Hardinsburg 2,155 ft., Hardinsburg sand 2,173 ft., Golconda 2,190 ft., Barlow 2,322 ft., Cypress sand 2,440 ft., Paint Creek 2,509 ft., Renault 2,640 ft., Aux Vases sand 2,684 ft., Ste. Genevieve 2,708 ft., Rosiclare 2,778 ft., Fredonia 2,831 ft.

Schuller & Lynch 1 Spencer, W½ NW SE 2-2s-8e, dry at 3,496 ft., Clore 2,387 ft., Palestine 2,413 ft., Menard 2,483 ft., Waltersburg 2,535 ft., Waltersburg sand 2,561 ft., Vienna 2,646 ft., Tar Springs 2,650 ft., Tar Springs sand 2,666 ft., Glen Dean 2,725 ft., Hardinsburg 2,773 ft., Golconda 2,867 ft., Barlow 2,949 ft., Cypress sand 2,959 ft., Paint Creek 3,118 ft., Benoist 3,130 ft., Benoist sand 3,152 ft., Renault 3,213 ft., Aux Vases sand 3,274 ft., Ste. Genevieve 3,327 ft., St. Louis 3,460 ft.

White County: McKee-Marshall 2 B. Bramlett, NW NW NW 15-6s-9e, dry at 2,942 ft., Kincaid 1,968 ft., Menard 2,288 ft., Waltersburg 2,353 ft., Vienna 2,435 ft., Tar Springs 2,445 ft., Glen Dean 2,551 ft., Golconda 2,650 ft., Barlow 2,756 ft., Cypress 2,777 ft., Paint Creek 2,899 ft., Benoist 2,929 ft.

Fields

Clay City, Wayne County: Pure 1 Beckel Consol., E½ NW SE 11-1n-7e, pumped 126 bbl. oil and 120 bbl. water, 5,000 gal. acid, Rosiclare 3,040-43 ft., McClosky 3,076-80 ft., T.D. 3,110 ft.

Pure 1-B Hubble, W½ SE SE 28-2n-8e, pumped 46 bbl., 5,000 gal. acid, McClosky 3,024-39 ft., 3,076-77 ft., T.D. 3,090 ft.

Dale, Hamilton County: Ohio 3 C. W. Hall, NW SW SW 8-6s-7e, pumped 104 bbl. oil and 66 bbl. water, 60-qt. shot 3,004-28 ft., Aux Vases 2,989 ft., T.D. 3,031½ ft.

Dundas, Jasper County: Pure 1 H. C. Worchester, E½ SE NW 19-5n-10e, flowed 614 bbl., 5,000 gal. acid, McClosky 2,865-70 ft., T.D. 2,890 ft.

East Centerville, White County: Sun 1 G. M. Bixenstine, SE NE NE 7-4s-10e, dry at 3,267 ft., Menard 2,384 ft., Tar Springs 2,518 ft., Glen Dean 2,576 ft., Golconda 2,713 ft., Barlow 2,827 ft., Cypress sand 2,862 ft., Paint Creek 2,982 ft., Benoist 2,987 ft., Renault 3,048 ft., Aux Vases sand 3,106 ft., Ste. Genevieve 3,136 ft., McClosky 3,234 ft.

Irvington, Washington County: Magnolia 2 C. Koelling, SW SE NE 15-1s-1w, pumped 46 bbl., 7-qt. shot 1,535-38 ft., Benoist 1,531 ft., T.D. 1,538 ft.

Johnsonville, Wayne County: Wiser Oil 2-C Dickey, NW NW NE 3-1s-6e, pumped 325 bbl., natural, Aux Vases 3,028 ft., T.D. 3,054 ft.

Louden, Fayette County: Carter 23-8 J. Brooks, SE NW SE 23-8n-3e, repressure well, Glen Dean 1,285 ft., Cypress 1,402 ft., Cypress sand 1,433 ft., T.D. 1,475 ft.

Maunie, South, White County: Magnolia 13 Sisson-Higgins, pumped 24 bbl. natural, Tar Springs sand 2,263 ft., T.D. 2,276 ft.

New Harmony, White County: Ivan White et al 1 C. G. Finch, SE NE NE 7-5s-14w, dry, Ste. Genevieve 2,930 ft., McClasky 2,974 ft., old well deepened from 2,910-3,015 ft.

First Nat. Pet. Trust 5 Ford, NW SW SW 22-4s-14w, dry at 2,854 ft., Kincaid 1,755 ft., Degonia 1,850 ft., Menard 2,058 ft., Waltersburg 2,132 ft., Tar Springs 2,270 ft., Glen Dean 2,335 ft., Hardinsburg 2,344 ft., Golconda 2,543 ft., Cypress sand 2,598 ft., Benoist 2,771 ft., Aux Vases 2,824 ft.

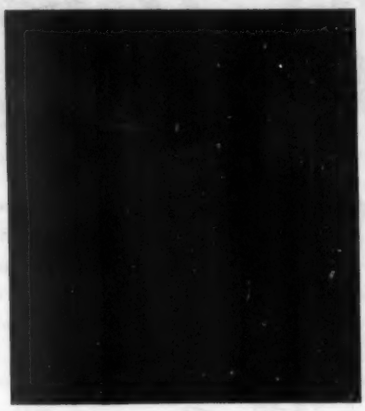
Roland, White County: Kingwood and Sinclair 1 Hale, SW NW SW 1-7s-8e, pumped 58 bbl. oil and 2 bbl. water, 3-qt. shot 2,755-57 ft., 10-qt. shot 2,756-60 ft., Benoist 2,747-60 ft., T.D. 2,934 ft., P.B. 2,764 ft.

Carter 7 Hamilton, SW SE SE 2-7s-8e, pumped 70 bbl., 60-qt. shot 2,772-87 ft., 100-qt. shot 2,914 ft., Benoist sand 2,771 ft., Aux Vases sand 2,930 ft., T.D. 2,950 ft.

Rural Hill, Hamilton County: Shell 6-B J. F. Crabtree, SW NE NE 23-6s-5e, pumped 110 bbl. oil and 11 bbl. water, perf. 3,148-74 ft., 3,000 gal. acid, 20-qt. shot 3,090-3,104 ft., Aux Vases 3,077-3,108 ft., Levias 3,163-70 ft., T.D. 3,328 ft., P.B. 3,165 ft.

Magnolia 9 C. R. Sloan, flowed 264 bbl., 50-qt. shot

(Continued on Page 85)



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Neglect is almost as destructive as sabotage. If your water supply system is not in tip top order, call in Layne and have necessary repairing and reconditioning done at once. Materials, except for strictly war work, may not be available later. Maintaining present equipment is real conservation.

If you require more water, arrange for additional wells and pumps without delay. Better call in a Layne engineer. He will cooperate with you in planning your additional water supply so as to use the minimum amount of materials essential to war work, yet give you an adequate, efficient and long lived installation. Layne wells and pumps are designed for your requirements regardless of size. They are noted for their high efficiency and trouble free service. They are serving all types of industries, municipalities both large and small, army and navy needs, training camps, flying fields and munitions plants.

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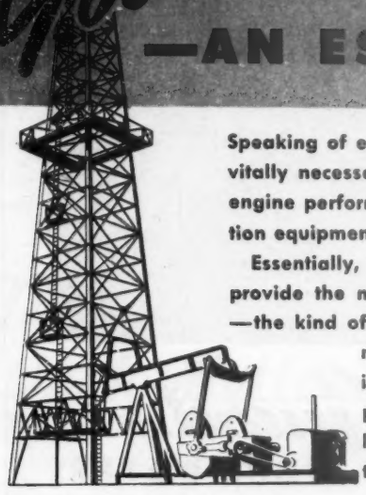

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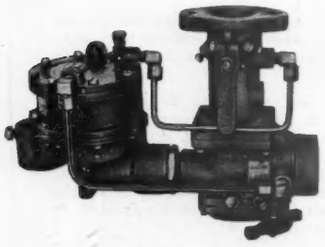

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DEPARTMENT OF GEOLOGY

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An unusually informative discussion of how and where oil occurs, how it is discovered, and how possession of oil resources affects world affairs.

CANADIAN FIELDS

Gas-Oil Ratio Regulation May Increase Production

By VICTOR LAURISTON

CHATHAM, Ont.—Crude and natural-gasoline production from all Alberta fields for the week ending February 23 averaged 30,307 bbl. daily, compared with a daily average of 29,848 bbl. for the previous week and 25,286 bbl. for the corresponding week last year. The daily average included 28,974 bbl. of crude and 1,036 bbl. of natural gasoline from Turner Valley and 297 bbl. of crude from other fields. There were 202 producing wells, not including gas wells, with 37 drilling, 9 testing, 2 finished, 1 spudded, and 1 new drilling license.

Turner Valley Allowables

The Petroleum and Natural Gas Conservation Board has announced that for March the Turner Valley field will be permitted to yield 27,635 bbl. of crude daily, an increase of 1,635 bbl. daily over the allowable production of 26,000 bbl. at which the field has been stabilized ever since January 1941. The increased quota is a step toward the gradual adoption of a new conservation system recommended by Dr. George Grainger Brown, under which wells will be permitted to produce the maximum of crude provided they do not exceed a specified withdrawal of reservoir fluid (oil and gas as mixed in the formation.) The tentative plan permits the withdrawal of 25 bbl. daily of reservoir fluid for each acre drained by a well. The new system will be gradually applied over a period of 6 months, and is expected to reduce gas wastage while resulting in a steady increase in crude production as new wells are brought in.

Pipe-Line Facilities

Additional pipe-line facilities may be required to handle the Turner Valley output as a result of increased crude production. The existing pipe-line system of the Royalite Oil Co. is being operated close to capacity, handling in excess of 28,000 bbl. daily, to Calgary. Of the field output, some 1,300 bbl. daily of crude and natural gasoline are used in the Gas & Oil Products, Ltd., refining plant in Turner Valley and the remainder is either transported to Calgary by pipe line or put in field storage. Recent increases in crude production are due to large new completions in North Turner Valley.

In North Turner Valley, Miracle Royalties 2, LSD 6, 4-21-3w5, finished at 7,753 ft. with the Madison at 7,340 ft., was treated with 4,000 gal. of acid in the upper and 2,000 gal. in the lower lime. It flowed 1,246 bbl. in an initial 15-hour test, or at the rate of close to 2,000 bbl. daily, and is now completing official tests, with indications that it may prove the largest producer in the field.

TURNER VALLEY LIME TESTS

North Turner Valley: Atlas-British Dominion 2, LSD 4, 17-21-3w5, T.D. 8,710 ft., Madison at 8,285 ft., most northerly completion, made 941 bbl. on 24-hr. test.

Major Oil Investments 4, LSD 8, 8-21-3w5, T.D. 7,836 ft., Madison at 7,415 ft., made 1,286 bbl. on 24-hr. run, testing for quota.

Foothills Oil & Gas 11, LSD 11, 4-21-3w5, finished at 7,422 ft., Madison at 6,878 ft.. placed on separator with flush production 30 bbl. hourly.

Foothills Oil & Gas 10, LSD 2, 4-21-3w5, T.D. 8,069 ft., Madison at 6,619 ft., acidizing and testing.

Royalite Oil 62, LSD 3, 22-20-3w5, below 8,990 ft., Madison at 8,832 ft.

West Central section: Anglo-Canadian 11, LSD 5, 25-19-3w5, T.D. 8,119 ft., Madison at 7,885 ft., acidizing and testing upper porous zone.

Sarcee Reserve Drilling

In the Sarcee Reserve area, a potential northerly extension of the North Turner Valley field, early indications are for deep drilling. Major Oil 11, LSD 12, 9-23-4w5, the most northerly active test, was still in the Belly River formation below 3,448 ft., and farther south, Inland-Sarcee 2, LSD 2, 4-23-4w5, has failed to confirm the upper Benton formation at 4,236 ft. Recent North Turner Valley completions have usually got the upper Benton between 600 and 2,600 ft., which would indicate considerably deeper drilling in the part of the Sarcee area now under test, unless the lower formations pinch out.

LEGAL

United States Department of the Interior, District Land Office, Las Cruces, New Mexico. Notice is hereby given that the lands herein described in the Artesia Oil and Gas Field, New Mexico are offered to the qualified bidder of the highest amount offered per acre as a bonus for the privilege of leasing the lands under section 17 of the leasing act as amended by the act of August 21, 1935 (49 Stat. 675; 30 U.S.C. 185) at the royalty rate scale in the lease form shown in Circular 1386 at a sale to be held in the United States Land Office at Las Cruces, New Mexico at 10 o'clock A.M. April 22, 1942 in the following parcels: Parcel #1, T. 18 S., R. 27 E., Sec. 1, SE¼; Parcel #2, T. 18 S., R. 27 E, Sec. 12, all. The successful bidder must deposit on date of sale with the officer in charge of the sale a certified check on a solvent bank or cash for one-fifth of the amount bid by him and file the showing of qualifications to receive a lease required by section 7 of Circular 1386. The remainder of the bonus and the annual rental at the rate of $1.00 per acre must be paid and a $5000 corporate surety bond must be furnished prior to the issuance of the lease. Bids may be submitted for both parcels of land provided the aggregate acreage of such parcels and all other holdings of the bidder in the Artesia field is not in excess of 2560 acres, separate leases to issue for each parcel. Bidders are warned against violation of section 59, United States Criminal Code, approved April 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids in the discretion of the Secretary of the Interior. Register.

Southeastern Saskatchewan

Bobjo Mines is finishing its No. 6 structure test required to validate its 5,000-acre block in southeastern Saskatchewan. The company will start work on its first commercial test early in the spring.

Monitor Test Abandoned

In the Monitor area, eastern Alberta, McColl-Frontenac 1, LSD 4, 5-32-4w4, finished in the Devonian limestone at 3,803 ft., has been abandoned and plugged, after testing two small oil shows without getting commercial production. McColl-Frontenac 2, LSD 16, 17-29-5w4, is rigging.

New Aldersyde Test

In the High River-Aldersyde area, New Ranchmen's 1, LSD 16, 34-19-29w4, sponsored by Maynard J. Davies and associates of Calgary, is digging cellar, and expected to spud this month. Location is 12 miles west and 18 miles south of Ranchmen's Gas & Oil 1, LSD 16, 13-20-29w4, now standing above the lime at around 7,250 ft. after encountering numerous oil and gas shows. The general area, east of the fault which marks the eastern limit of the Turner Valley field, is believed to have interesting possibilities.

British Columbia Test

Work will be resumed shortly on the provincial government test at Commotion Creek, in the Peace River block in northern British Columbia. The well was shut down last fall around 5,500 ft. and at the recent session of the British Columbia Legislature $100,000 was provided to continue drilling operations. Location is close to the projected route of the Canada-Alaska highway.

Ontario Completions

Recent extensive drilling for gas in southwestern Ontaria has resulted in 17 producers with 14 dry holes. Total production added was 2,354,000 cu. ft.

MICHIGAN OPERATIONS

Traverse Production May Open Pool in Lake County

By OTTO C. PRESSPRICH

SAGINAW, Mich. — A prospective new oil field developed in western Michigan last week when William B. Shoemaker brought in a flowing well in Saubee Township, Lake County, some 30 miles from any previous production. Lacking storage facilities, the hole was capped immediately, delaying a test for several days until a mile of road can be constructed and tanks hauled to the scene.

The oil developed from the Traverse formation at 2,111 ft., the pay being reached Thursday. Location is 10 miles northwest of Baldwin in Section 16 on the Rose Matson farm. Nearest production is in the Reed City field. Early guesses as to the wildcat's potential ranged upward from 1 bbl. a day.

Federal regulations were reflected in the completion reports for the week, with only 10 tests scattered through eight counties. Some improvement was indicated, however, as approval was given to a 125-bbl. allowable per well in flush fields and favorable changes developed in drilling regulations.

Only 4 of the 10 completions brought production. Dry holes included the Allegan and Newaygo wildcat tests as well as the Wexford County test which had promised some new development. Shakespeare et al announced they were chalking up as a dry hole the 1 Cadillac, in Colfax Township, when the oil show proved inadequate for commercial development.

The state Conservation Department last week issued 9 drilling permits, raising the total for the year to 76. Two permits each were approved for locations in Allegan and Clare counties. The others are for operations in Gladwin, Osceola, Lapeer, Cass, and Van Buren counties.

MICHIGAN COMPLETIONS

Allegan County, Casco Township: Voorhees Drilling Co. 1 Sankofski, SW SE NE 1-1n-16w, dry, T.D. 1,187 ft., wildcat.

Trowbridge Township: Leonard C. Sleep 4 Bridgeman, NW SW NW 29-1n-13w, 25 bbl., acidized, T.D. 1,371 ft.

Bay County, Kawkawlin Township: Chapman Oil Co. 2 Duso, C N½ NE NE 34-15n-4e, 332 bbl. first 8½ hr., settling to 60 bbl. in 24 hr., acidized, T.D. 2,916 ft.

Clare County, Lincoln Township: Leonard Drilling Co. et al 1 McGinnis, SE SE SW 25-18n-5w, location abandoned.

Gladwin County, Beaverton Township: Sun Oil Co. 3 Keller, C E½ NW NE 35-17n-2w, 180 bbl. first 16 hr., settling to 100 bbl. next 24 hr., acidized, T.D. 3,885 ft.

Isabella County, Broomfield Township: William P. Boles 1 Bacon-Swan communitized, C NE 1-14n-6w, dry, T.D. 1,338½ ft., gas test.

Newaygo County, Ensley Township: Southwest Development Co. 1 Butler, NE NW NW 7-11n-11w, dry, T.D. 433 ft., dry.

Osceola County: Lincoln Township: Don Rayburn B-2 Gabel, SE NW SW 31-18n-10w, 140 bbl., acidized, T.D. 3,648 ft.

Shiawassee County, Burns Township: E. C. Barlow 1 Barlow, SE SE NE 4-5n-4e, dry, T.D. 2,181 ft., wildcat.

Tuscola County, Akron Township: Brehm Oil Co. and O. Jaenicke A-1 Childs, SW SW SW 19-14n-4e, T.D. 3,978 ft., dry.

Wexford County, Colfax Township: Shakespeare Associates 1 Cadillac City, C W½ SE NE 35-23n-10w, dry in Dundee, T.D. 3,917 ft., wildcat.

ROCKY MOUNTAIN AREA

Renewal of Interest in Oil-Shale Lands Is Seen

By T. R. INGRAM

DENVER, Colo. — Prospective opening of the immense oil-shale deposits in Colorado and Wyoming has become a live subject recently not only in these states but in Washington, and while the discussion is mostly in the speculative stage, out of it may grow a renewal of interest in that subject. There is no activity in the field at the present time and it is generally conceded that the long road ahead will not make shale oil available in the present emergency, but out of war conditions it is conceived that development may again come to the front in the near future. (See The Oil and Gas Journal, Feb. 26, p. 96.)

The U. S. Geological Survey has classified 952,239 acres in Colorado alone as oil-shale land. The federal Government has two reserves in the state which were set aside primarily to assure an ample supply of oil for the Navy in the future. Reserve No. 1 in Garfield County was created by executive order in 1916 and embraces 45,440 acres, and No. 3, which adjoins No. 1, was created by President Coolidge in 1924 and comprises 22,000 acres. The late Dean E. Winchester, who made a special report for the Government in 1928, estimated No. 1 reserve contained shale from which 2,500,000,000 bbl. of crude oil could be recovered.

The big play in oil-shale land reached its climax in 1927 when the major oil companies were acquiring holdings. The extent of this activity may be judged from the fact that in 1927 $154,882 in fees were paid into the Denver Land Office with applications for patents on shale land. That amount did not include purchase price for claims nor the $500 per claim which had to be expended for development work before the land was subject to patent. Among these applicants were some of the major oil companies. The Union Oil Co. of California had at that time expended over a million dollars in research work on the holdings it acquired. Most of these companies whose land went to patent still hold their acreage.

The activity developed from a threatened oil shortage. Then came a new flood of crude which lowered the price below what it could be produced from shale and the interest died down. At that time the primary objective was to recover gasoline and lubricating oils. It was known that hundreds of byproducts could be recovered, but there was a limited market for these. Since that time, however, chemical engineering has made vast strides and any future research will give more attention to that phase of the business. There is an angle to this which is mentioned without any attempt to confirm it, but is pertinent at this time. This was to the effect that in some of the experiments a sheet of synthetic rubber was recovered which was so clear that it could be looked through as though it was glass. There was no shortage of crude rubber at that time and it was said that the recovered sample was considered more as a curiosity than a commercial possibility.

Wilson Creek Extended

The Wilson Creek field in Colorado was extended ¼ mile to the northeast in Texas 8 Unit, joint with California Co., which flowed 485 bbl. natural through perforated casing from the Morrison sand.

Husky Refining 2 Stump, Cody (Shoshone) field, Park County, Wyoming, is showing for a discovery in a deeper sand. It is drilling at 4,753 ft. in saturated Tensleep sand topped at 4,625 ft. This sand lies below the Embar, the producing horizon.

Two wildcats at critical stages are the Superior Oil test on Pilot Butte, Fremont County, Wyoming, and Sinclair-Wyoming 1 Mary Carter on Sherrard dome, Carbon County, Wyoming. First named is drilling at 6,393 ft. in white sand, hard and tight. The sand is in the Tensleep and was topped at 6,177 ft. A drill-stem test was made in the upper part of the sand, but results were not stated. It is known, however, to have shown some saturation. The Sherrard well topped the Tensleep at 5,057 ft. and stopped at 5,100 ft. to run casing. It showed saturation and indications are favorable for a discovery. The structure is south of the Wertz field and the company has a unitized block of 11,000 acres.

COLORADO COMPLETIONS

Wilson Creek field, Rio Blanco County: Texas-California Cos. 8 Unit, NW SE NW 26-3n-94w, T.D. 6,888 ft., cemented 7-in. on top Sundance at 6,886 ft., P.B. and perf. opposite Morrison sand, flowed average 485 bbl. daily.

Rangely field, Rio Blanco County: John Bockhold 1 Gentry, Lot 8, 3-1n-102w, T.D. 1,277 ft., 10 bbl. daily on pump from fractured shale.

WYOMING COMPLETIONS

Lance Creek field, Niobrara County: Continental 8 Rodeo-4, NE SE NE 35-36n-65w, T.D. 4,420 ft., swabbed 22 bbl. in 9 hr. from basal Sundance, top at 4,394 ft., not yet tested on pump.

Continental 6 Apex-1, NW SW NE 34-36n-65w, T.D. 5,520 ft., swabbed and flowed 157 bbl. in 9 hr. from Leo sand, 7-in. at 5,342 ft., acidized with 1,000 gal., not yet tested on pump.

(Continued on Page 91)

Washington Anticline Wildcat Has Water in Oriskany

PITTSBURGH, Pa.—On the Washington anticline in Richhill Township, Greene County, Pennsylvania, the deep test of the Natural Gas Co. of West Virginia on the Andrew Workman farm topped the Oriskany sand at 7,016 ft. and is drilling at 7,036 ft. There was no showing of gas or oil and at 7,034 ft. salt water intruded at the rate of about 1½ bailers an hour. Drilling, however, will be continued through the sand if the water does not prevent. The Onondaga lime was corrected to top 6,776 ft.

On Chestnut Ridge in South Union Township, Fayette County, Peoples Natural Gas Co. again ran the tools in I Piedmont Coal Co. and drilled 4 ft. to 6,849 ft. in the Helderberg. The volume increased to 14,000,000 cu. ft., which was turned in the lines. The rock pressure, after withdrawal of considerable gas, is low and does not build up rapidly.

On the Fayette anticline in South Huntington Township, Fayette County, Peoples Natural Gas Co. is drilling at 7,550 ft. in the deep test on the Jacobs Creek Oil Co. with some evidence that it is approaching the Oriskany sand.

SOUTHWEST PENNSYLVANIA COMPLETIONS

Armstrong County, Kittanning Township: John Wray et al 1 John Nelson, 133,000 cu. ft. gas, Murraysville sand 1,380-1,479 ft., Fifth sand 2,036-56 ft., Tiona 3,020-50 ft., second Bradford 3,404-34 ft., gas 1,385, 2,050, 3,028 and 3,406 ft., T.D. 3,502 ft.

Scholl et al 1 Carl Becker, 13,000 cu. ft. gas, Tiona 3,155-85 ft., gas 3,158-61 ft., T.D. 3,443 ft.

Plum Creek Township: Sheiocta Oil & Gas Co. 1 Charles Graff, 178,000 cu. ft. gas, Bradford 3,535 ft., gas 3,540 ft., T.D. 3,737 ft.

Butler County, Forward Township: Larkin et al 1 George Larkin, dry, Hundred-foot sand 1,302-1,401 ft., T.D. 1,500 ft.

Fayette County, German Township: Peoples 1 J. A. Baer, 354,000 cu. ft. gas, final gage from 1,000,000 cu. ft., Speechley sand 3,446-67 ft., gas 3,447-49 and 3,460-63 ft., T.D. 3,520 ft.

Greene County, Wayne Township: H. D. Freeland et al 1 J. F. Kent heirs, dry, Elizabeth sand 3,261-70 ft., T.D. 3,300 ft. This was deepened from the Gordon sand.

Washington County, Nottingham Township: Equitable 1 Howard Leyda (Waldo Crouch), 11,600 cu. ft. gas, will abandon, Big lime 1,235-65 ft., Big Injun 1,265-1,495 ft., Thirty-foot 1,920-45 ft., Nineveh Thirty-foot 2,082-85 ft., Bayard 2,385-2,501 ft., Sweet Richard 2,706-15 ft., T.D. 3,701 ft.

East Finley: S. F. Flack et al 1 George Ealy, drilled deeper, dry, through Gordon, T.D. 3,139 ft.

South Franklin Township: Union Gasoline & Oil Corp. 1 H. R. Post, drilled deeper, dry, Fifth sand 2,855-78 ft., T.D. 2,878 ft.

Westmoreland County, Bell Township: Peoples 1 C. B. Carnahan, 340,000 cu. ft. gas, Speechley sand 2,994-3,004 ft., gas 2,997-99 ft., T.D. 3,044 ft.

WEST VIRGINIA

In Meade district, Tyler County, the deep test of Benedum & Trees is drilling at 2,336 ft. on the Pearl Broadwater farm.

WEST VIRGINIA COMPLETIONS

Boone County, Washington district: South Penn 65 Yawkey-Freeman, 253,000 cu. ft. gas, Big lime 1,645-1,812 ft., Big Injun 1,812-67 ft., Berea 2,298-2,328 ft., R.P. 375 lb., T.D. 2,338 ft.

South Penn 70 Yawkey-Freeman, 231,000 cu. ft. gas and 8 bbl. oil, Big lime 1,740-1,902 ft., Big Injun 1,905-52 ft., Berea 2,398-2,427 ft., R.P. 175 lb., T.D. 2,451 ft.

Calhoun County, Center district: Godfrey L. Cabot, Inc., 13 Allen Hardman, 412,000 cu. ft. gas, Big lime 2,022-2,104 ft., Big Injun 2,104-44 ft., gas 2,158-65 ft., shot 2,157-73 ft., T.D. 2,214 ft.

Sheridan district: South Penn 5 Frank E. Rothlisberger, 10 bbl., Maxton sand, T.D. 1,875 ft.

Sherman district: Hagan T. Francis 1 Walter Stump, 5 bbl., Big lime 1,795-1,875 ft., Big Injun 1,875 ft., oil 1,891-1,939 ft., shot 1,891-1,938 ft., T.D. 1,940 ft.

Lincoln County, Jefferson district: R. H. Adkins 1 Dora Hill, 60,000 cu. ft. gas after shot, Big lime 1,544-1,745 ft., Big Injun 1,745-75 ft., Berea 2,242-67 ft., brown shale 3,335-85, 3,530-3,670 ft., T.D. 4,084 ft.

Logan County, Logan district: Boone County Coal Co. 22 fee, 1,000,000 cu. ft. gas, Big lime, T.D. 2,280 ft.

Pleasants County, Jefferson district: A. F. Marple 6 D. A. Bell, dry, through Cow Run sand, T.D. 941 ft.

Putnam County, Curry district: Massey Oil & Gas Co. 1 H. & A. Carpenter, 169,000 cu. ft. gas, Big lime 1,360-1,540 ft., Big Injun 1,605-30 ft., Berea 2,043-68 ft., shot 2,043-68 ft., T.D. 2,075 ft.

United Fuel 5078 W. G. May, 502,000 cu. ft. gas, Big lime 1,375-1,539 ft., Big Injun 1,558-1,610 ft., Berea 2,047-71 ft., brown shale 3,210-3,600 ft., shot 3,206-3,600 ft., T.D. 3,612 ft.

Winn Gas Co. 2 Walter Johnson, 169,000 cu. ft. gas, Big lime 1,366-1,544 ft., Injun 1,554-91 ft., Berea 2,042-66 ft., shot 2,042-66 ft., T.D. 2,091 ft.

Ritchie County, Murphy district: W. H. Bickel 1 Birdie K. McCosh et al, 539,000 cu. ft. gas, second Salt sand 1,519 ft., Maxton 1,656-65 ft., T.D. 1,665 ft.

Wood County, Walker district: Grant Farm Oil Co. 9 C. D. Grant, 10 bbl., Cow Run sand 1,085-1,110 ft., Injun 1,660-1,850 ft., completed in Berea at 2,216 ft.

ORISKANY GAS FIELDS

Jackson County, Ripley district: West Virginia Gas Corp. 1 G. O. Monday 4,777,000 cu. ft. gas, Big lime 1,895-2,020 ft., Big Injun 2,020-60 ft., Berea 2,440-45 ft., Corniferous 4,954-5,054 ft., gas 5,057-85 ft., R.P. 1,280 lb., T.D. 5,085 ft.

Spartan Gas Co. 1 Roy Burnem, 8,718,000 cu. ft. gas, Salt sand 1,850-2,050 ft., Big lime 2,060-2,160 ft., Big Injun 2,160-2,218 ft., Berea 2,580-2,605 ft., Corniferous 5,119-5,234 ft., Oriskany 5,234 ft., shot 5,234-67 ft., R.P. 1,840 lb., T.D. 5,270 ft.

Washington district: Spartan Gas Co. 1 Lucy & V. L. Carney, 3,451,000 cu. ft. gas, Big lime 1,822-1,942

(Continued on Page 85)

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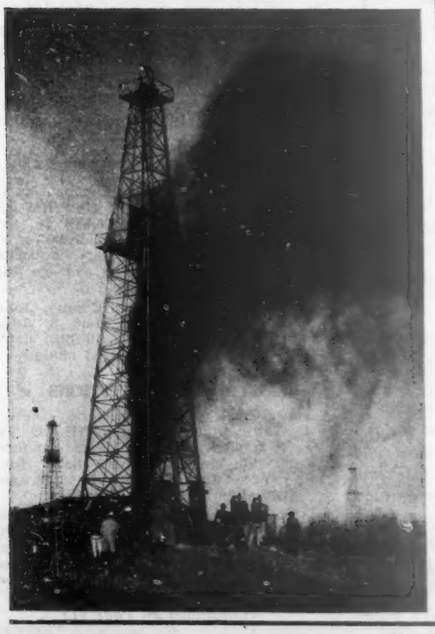

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Osage Lime Production Shows For First Time in Basin

EVANSVILLE, Ind.—The Osage formation has produced oil for the first time in the Tri-State area, as nearly as can be determined.

Kingwood Oil Co.'s 1 Fithan, E½ SE SE 23-1n-10w, in the Hazleton area of Gibson County, flowed oil after a drill-stem test in that formation had been opened 15 minutes. Saturation was at 2,402-9 ft. and the drill-stem test was made at 2,400-15 ft. The recovery on the drill-stem test was broken down as follows: 1,800 ft. of gas, 20 ft. of oil, 100 ft. of gas, 450 ft. of oil, and 10 ft. of sulfur water. The well is now drilling below 2,650 ft. and will be taken to the Devonian, the originally scheduled depth. Only other production in the area at present is from the McClosky and Salem limes.

Posey County Test Drilling Ahead

Carter Oil Co.'s 1 Baker, SW SW 9-7s-14w, is drilling below 2,935 ft. after recovering a 9-ft. core at 2,906-24 ft. which was dry. The Cypress and Waltersburg sands, productive formations in the Mount Vernon pool east and north of 1 Baker, carried water with no oil. No other commercial shows have been found.

Installation of pumping equipment was under way during the latter part of the week at a pool-opening well in the south part of Posey County, Sinclair-Wyoming 1 D. G. Nash, SW SW NE 32-7s-14w. On a 24-hour swab test prior to installation of pumping equipment the well yielded 230 bbl. of oil from the upper McClosky at 2,738-44 ft. No. 1 Nash is 3½ miles from production in the Mount Vernon pool.

INDIANA COMPLETIONS

Wildcats

Martin County: Burton & Brewer 1 Burrows, NE NE NW 16-2n-4w, dry at 485 ft.

Spencer County: O. D. Vickers et al 1 E. Sauter, N½ NE NE 32-6s-5w, location abandoned.

Sullivan County: E. M. Self 1 James Land, NE NE NE 36-7n-9w, dry at 2,508 ft.

Vanderburg County: Sells Petroleum 1 J. Y. Welborn, NE NE SW 32-6s-11w, dry at 824 ft., lower Menard 1,735 ft.

Gene Longaria 1 W. L. Bauer, SW SW SW 22-7s-11w, location abandoned.

Fields

Hatfield, Spencer County: A. A. Barton 1 D. Abbot, SW SE SW 6-7s-7w, location abandoned.

Trenton, Madison County: A. W. Modert 1 Azimon, SE SE SE 16-21s-8e, dry at 1,018 ft.

Trenton, Rush County: Eastern Indiana Gas 2 Johnson, NW SE NE 34-13n-9e, 150,000 cu. ft. gas, 80-qt. shot on bottom, Trenton 884 ft., T.D. 894 ft.

Eastern Indiana Gas 2 E. Lamberson, NW NW NE NE 4-15n-11e, 500,000 cu. ft. gas, Trenton 883 ft., T.D. 904 ft.

OHIO

ZANESVILLE, Ohio.—Muskingum County presented the only bright spot in the Ohio fields with a 2,500,000-cu. ft. Clinton sand gasser in the Brush Creek pool.

Activity in the Clayton pool, Perry County, was given a spurt by the approval of exceptions filed for eight locations on which rigs have been standing since the middle of last December.

A number of new gas locations have been made in the various fields, one large operator staked 18 tests.

The Magnolia 1 Dom. Giovannone, at Lordstown, Trumbull County, is drilling in the lime at 3,400 ft.

OHIO COMPLETIONS

Coshocton County, Pike Township: Clive Davis et al 1 Vernon George, SW Sec. 7, small gas well with some oil, Clinton sand, T.D. 3,147 ft.

Jackson County, Jackson Township: F. G. Green 1 fee, 20,000 cu. ft. gas, Weir, T.D. 365 ft.

Knox County, Brown Township: Upham & Ridgeway 1 Edwin M. Bailey, SW Sec. 22, 40 bbl., Clinton sand, T.D. 2,735 ft.

Licking County, Madison Township: Ohio Fuel 1 J. G. Fromholz, Lot 9, 2d Quarter, 20,000 cu. ft. gas, plugged, Clinton 2,448-84 ft., T.D. 2,486 ft.

Meigs County, Orange Township: H. B. Welker Co. 1 Garner Griffith, Sec. 36, 4 bbl., shot, Berea, T.D. 1,755 ft.

Monroe County, Wayne Township: Driggs Oil Co. 3 G. B. Drake, Sec. 19, 75,000 cu. ft. gas, Keener and Berea, T.D. 1,920 ft.

Morgan County, York Township: Sturm Co. 2 Manly McLaughlin, Sec. 22, 300,000 cu. ft. gas, blew out, plugged, Clinton 4,222-70 ft., T.D. 4,276 ft.

Muskingum County, Harrison Township: Sutton Bros. 3 J. H. Busomer, Sec. 8, 2,500,000 cu. ft. gas, Clinton 4,016-43 ft.

Noble County, Noble Township: F. W. Fassett 7 J. B. Hayes, NW Sec. 34, dry, small showing oil, Macksburg 300-ft. sand, T.D. 250 ft.

Summit County, Richfield Township: Wiser Oil Co. 1 A. & L. M. Stouffer, Lot 1, 35 bbl., shot, Oriskany sand, T.D. 2,098 ft.

Tuscarawas County, Lawrence Township: Natural Gas of W. Va. 1 Arthur Lebold, 1st Quarter, 400,000 cu. ft. gas, Clinton, T.D. 4,530 ft.

Washington County, Newport Township: Schneider Oil Co. 22 John Haynes, Sec. 27, dry Injun, T.D. 1,445 ft.

Adams Township: Columbian Carbon Co. 1 Chas. H. Augenstein, Bear Creek allotment, Lot 49, dry through Oriskany, T.D. 4,443 ft.

Washington Township: Wittmer Co. 1 Lemert Ferrel, Lot 21, 600,000 cu. ft. gas, Cinnamon shale 2,220-2,465 ft., 400,000 cu. ft. gas, shot, Clinton 3,990-4,011 ft., T.D. 4,107 ft.

EASTERN KENTUCKY

ASHLAND, Ky.—One gas well was completed in eastern Kentucky this week and drilling operations continued on the same general level. Although the clarification of the federal spacing order was received some few weeks ago there has not been a definite indication of new oil-well operations in this part of the state. Some wells, started before the issuance of the order, have been completed or are nearing that stage but no new oil-field locations have been reported.

With the type of formation sought, determining the type of well a number of operators are doubtless awaiting developments in other areas or additional information from the federal bureau.

COMPLETIONS

Floyd County: Kentucky-West Virginia Gas Co. 663 S. P. Davidson, 696,000 cu. ft. of gas at 1,481 ft.

WESTERN KENTUCKY COMPLETIONS

McLean County, city of Livermore: B & B Oil Co. 1 Rebecca Rock, 15 bbl., natural, McClosky 1,620-20½ ft.

Ohio County, Pleasant Ridge district: Wilkins & Massie 7 E. K. Moseley 10 bbl., shot 100 qt., Jett sand 818-59 ft.

Illinois Fields

(Continued from Page 81)

3,083-3,103 ft., Aux Vases sand 3,079 ft., T.D. 3,105 ft.

Ste. Marie, Jasper County: E. Novak et al 1 Shryock, E½ NE SE 6-5n-14w, pumped 270 bbl., 4,000 gal. acid, Ste. Genevieve 2,801 ft., Fredonia 2,840 ft., T.D. 2,861 ft.

West Clay City, Clay County: Pure 3-A L. A. Pearce, N½ SE NE 10-2n-7e, flowed 947 bbl., 5,000 gal. acid, McClosky 3,059-67 ft., 3,070-75 ft., T.D. 3,090 ft.

Pure 2 Stella Staley, N½ SE SW 10-2n-7e, flowed 490 bbl., 5,000 gal. acid, McClosky 3,077-80 ft., 3,082-92 ft., T.D. 3,097 ft.

Woodlawn, Jefferson County: Skelly 2 Woodlawn, NW SW SW 1-3s-1e, location abandoned.

Appalachian Fields

(Continued from Page 84)

ft., Big Injun 1,971-2,027 ft., Berea 2,402-12 ft., Corniferous 4,992-5,111 ft., Oriskany 5,111 ft., gas 5,114 ft., gas 5,119-28 ft., R.P. 1,880 lb., T.D. 5,123 ft.

Kanawha County, Poca district: Columbian Carbon Co. 2 D. F. Fields, dry, top Salt sand 1,357 ft., T.D. 1,479 ft.

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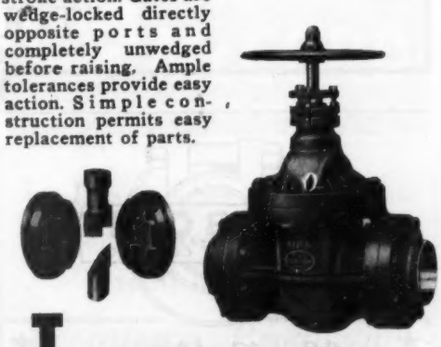

LUDLOW VALVES

SINCE 1866

Texas Gulf Coast

(Continued from Page 72)

Fields

Barbers Hill, Chambers County: Texas 6 Wilburn, old well, T.D. 5,426 ft., 36 bbl. pumping, perf. casing 4,650-70 ft.

Clodine, Fort Bend County: Providence 4 Hatfield, 125 bbl., ¼-in. choke, perf. casing 7,500-03 ft., T.D. 8,300 ft.

Fig Ridge, Chambers County: J. M. Frost 1-A fee, 774 bbl., ¼-in. choke, perf. casing 8,472-94 ft., T.D. 8,593 ft.

Francitas, Jackson County: Francitas Gas Co. 6 Broughton, 25 bbl., ⅛-in. choke, perf. casing 7,448-55 ft., T.D. 8,002 ft.

Ganado, Jackson County: Humble 1 Branch, 144 bbl., ⅛-in. choke, sand 6,440-49 ft.

Texas 8 Mortgage Land & Investment Co., 149 bbl., ⅛-in. choke, perf. casing 6,426-36 ft., T.D. 6,560 ft.

Lake Creek, Montgomery County: Superior 1-D McWhorter, 480 bbl. distillate, ¼-in. choke, perf. casing 9,278-93 ft., 9,776-9,828 ft., T.D. 10,360 ft.

Lolita, Jackson County: Magnolia 8 Four Way Ranch, 132 bbl., 9/64-in. choke, perf. casing 6,399-6,404 ft., T.D. 6,405 ft.

Markham, Matagorda County: Hamill & Hamill 1-A Smith, dry at 2,557 ft.

Maurbro, Jackson County: Moore & Ahern 3 Olsvosky, 149 bbl., 9/64-in. choke, perf. casing 5,217-23 ft., T.D. 5,229 ft.

Humble 3-B Mauritz, 336 bbl., ¼-in. choke, perf. casing 5,216-37 ft., T.D. 5,246 ft.

North La Ward, Jackson County: Harrison & Abercrombie 1 Woodruff, 93 bbl., pumping, T.D. 5,285 ft., P.B. 5,229 ft.

Magnolia 14 Gordon, 12 bbl., 7/64-in. choke, perf. casing 5,211-16 ft., T.D. 5,225 ft.

Phillips 3 Johnson, 11 bbl., ⅛-in. choke, perf. casing 5,214-21 ft., T.D. 5,281 ft.

Red Fish Reef, Chambers County: Humble 14a-264 State, dry, T.D. 9,425 ft.

Sour Lake, Hardin County: Eunice Carpenter 1 Brashara, 30 bbl. pumping, T.D. 3,853 ft., P.B. 3,845 ft.

Sugarland, Fort Bend County: Circle 1 Sugarland Industries, dry at 6,210 ft.

Texana, Jackson County: Sinclair Prairie 1 Gardner, dry at 8,037 ft.

Withers, Wharton County: F. W. Michaux, 147 bbl., 5/32-in. choke, perf. casing 5,313-21 ft., T.D. 5,355 ft.

F. W. Michaux 65-A Pierce, 167 bbl., 5/32-in. choke, perf. casing 5,330-37 ft., T.D. 5,415 ft.

F. W. Michaux 49-A Pierce, dry at 5,335 ft.

F. W. Michaux 67-A Pierce, 171 bbl., 5/32-in. choke, perf. casing 5,310-16 ft., T.D. 5,285 ft.

West Ganado, Jackson County: Pure 3 Fowler, dry at 5,250 ft.

La-Arkansas Fields

(Continued from Page 76)

W. G. Blanchard et al 1 Everglades, SW SW 31-53s-35e, in Dade County, reported a good gas show from 1,050 to 1,270 ft., encountered hard limestone at 2,560 ft., and are now shut down at 2,880 ft.

Drilling was resumed this past week on R. T. Myers et al 1 Walton Land & Timber Co., C SW 16-1n-18w, the well is now at 411 ft.

Georgia

The magnetometer prospect in Daugherty County, J. R. Sealy et al 1 Reynolds Brothers Lumber Co., SE SE Lot 116, second land district, is reported to be drilling at 3,210 ft.

Alabama

It is reported that a good show of gas was encountered at 1,562 ft. in the wildcat well being drilled near Oak Hill by Reid Clark. A testing crew was obtained from Louisiana, and Clark announced he would continue drilling for gas or oil unless a commercial supply was indicated immediately.

California Fields

(Continued from Page 71)

good for 977 bbl. per day under a natural flow. This latter well has been pinched down to 190 bbl. of 27.7-gravity oil and 200,000 cu. ft. of natural gas daily through a 7/64-in. bean. It is necessary to reduce the bean to $\frac{1}{16}$-in. at frequent intervals to keep production down to a minimum.

LOS ANGELES BASIN COMPLETIONS

Carbon Canyon wildcat district, Riverside County: Stella, E. F., 1 Kraemer, 33-2s-8w, dry, T.D. 5,238 ft.

Huntington Beach, Orange County: Kohlbush, H. S., 9 Pacific American, 34-5s-11w, pumping 103 bbl., 24.6 gravity, 3 per cent cut, T.D. 4,710 ft., perf. 4,602-37 ft. in Ashton zone (Pliocene).

Kohlbush, H. S., 10 Pacific American, 34-5s-11w, pumping 95 bbl., 24.5 gravity, 4 per cent cut, T.D. 4,545 ft., perf. 3,990-4,080, 4,235-75, 4,420-50 ft. in Ashton zone (Pliocene).

Rosecrans, Los Angeles County: Union 46 Rosecrans, 18-3s-13w, flowing 252 bbl., 28.8 gravity, 1 per cent cut, 317,000 cu. ft. gas, 76/64-in. bean, pressures 50/500 lb., T.D. 8,546 ft., perf. 7,863-8,543 ft. in eighth Callender zone (Miocene). Died after flowing 2 days, rigging up compressor.

Torrance, Los Angeles County: First National Finance Corp. 1 Stone, 30-4s-13w, flowing 95 bbl., 17.8 gravity, 3 per cent cut, 10,000 cu. ft. gas, 37/64-in. bean, pressures 50/75 lb., T.D. 3,659 ft., perf. 3,160-3,260 ft., 3,525-3,659 ft. in equivalent of Ranger zone at Wilmington.

Rosetta Oil Co. 2 Capitol, 30-4s-13w, pumping 123 bbl., 17.2 gravity, 5 per cent cut, T.D. 3,684 ft., perf. 3,164-3,294, 3,494-3,684 ft. in equivalent of Ranger zone at Wilmington.

Wilmington, Los Angeles County: Cleveland Oil Co. 1 McDonald, 29-4s-13w, pumping 110 bbl., 18.1 gravity, 3 per cent cut, T.D. 3,718 ft., perf. 2,940-3,000, 3,050-3,155, 3,240-3,330, 3,490-3,590, 3,670-3,715 ft. in Ranger zone.

Morse, C. M., 1 McBay, 32-4s-13w, flowed 160 bbl., 14.6 gravity, 3 per cent cut, 4,000 cu. ft. gas, 16/64-in. bean, T.P. 105 lb., T.D. 3,738 ft., perf. 3,200-3,300, 3,515-3,615, 3,680-3,738 ft. in Ranger zone.

Oklahoma Fields

(Continued from Page 75)

bbl., sandy dolomite 4,118-25 ft., T.D. 4,135 ft., old T.D. 4,059 ft.

Alma Oil 2 Rhodd, NW SE SW 32-7-5, dry, old T.D. 4,146 ft., P.B. 3,275 ft.

Spring, Jefferson County: Seitz, Comegys & Seitz 1-A Bounds, SW cor. 13-6s-6w, dry, T.D. 1,855 ft.

Terlton, North, Pawnee County: Selby Oil & Gas 3 Little, SE SW SW 1-20-7, 5 bbl., Bartlesville 2,450-71 ft.

Major Oil 1-B Moore, SW NW NE 12-20-7, dry, T.D. 2,702 ft., old T.D. 2,481 ft.

Wewoka, Hughes County: R. M. Tate 14 Frederick, NE NE NW 5-7-8, 84 bbl., Sylvan 3,999-4,030 ft., T.D. 4,038 ft.

Miscellaneous

Carter County: Mark, Alexander et al 1 Riley, NW NE NW 30-2s-3w, dry, T.D. 480 ft.

Creek County: Sinclair 2 Bell, NW SW SE 29-16-8, 20 bbl., Wilcox 3,800-12 ft., T.D. 3,845 ft.

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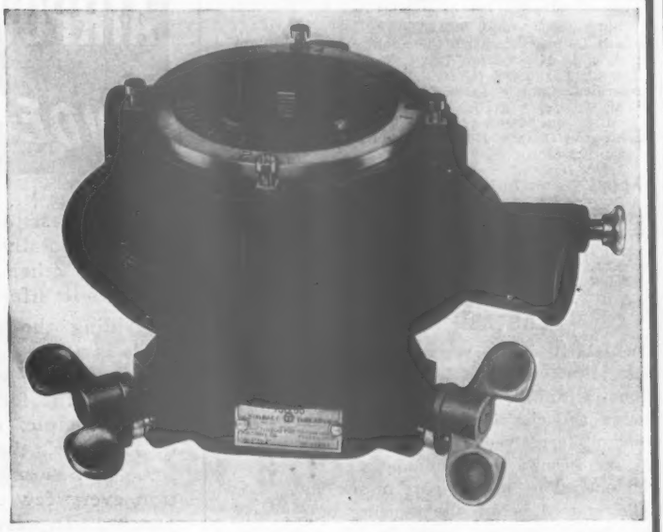

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L. B. Jackson 2 Gregory, NE SE NW 29-17-11, 800,000 cu. ft. gas, Glenn sand 1,958-83 ft., T.D. 1,989 ft.
Sinclair 2 Berryhill, E½ SE NW 16-17-12, 7 bbl., Glenn sand 1,390-1,558 ft., old T.D. 1,511 ft.
Bell Oil & Gas 3 Stanley, NE SW SE 33-18-10, dry, T.D. 2,682 ft.
Sinclair 14 Gooden, E½ NW SE 16-17-7, pumped 5 bbl., Bartlesville 2,704-2,814 ft.
Central Petroleum 4 Ricks, SW SE SE 16-17-9, pumped 12 bbl., shale 2,510 ft., T.D.
Link Oil 9 Haggard, SW NE NE 33-18-7, swabbed 6 bbl., T.D. 1,457 ft., to be used for repressure well.
Okfuskee County: Shell 5 Palmer, NW SE SW 6-10-9, 52 bbl., Booch sand 2,975-85 ft., T.D. 2,987 ft.
Caroline Oil 1-B Hudson, NW NW SW 1-11-8, 25 bbl., Hunton 3,890-99 ft., T.D. 3,944 ft.
Okmulgee County: A. L. Wilson 1-A Doneghy, SE SW NW 26-12-13, pumped 2 bbl., sand 1,278-1,300 ft., T.D. 1,304 ft.
W. B. Pine 3 Bates, N½ NE SE 30-12-13, dry, T.D. 1,302 ft.
Wood Oil 4 McAdoo, NE NE SE 28-13-13, dry, T.D. 1,758 ft.
W. O. Schock 1 Douglas, NE NW SE 17-14-11, pumped 120 bbl., Dutcher sand 2,442-60 ft., old T.D. 2,394 ft.
Osage County: A. G. Oliphant 2 Osage, NE NE SW 34-22-7, pumped 200 bbl., Wilcox 2,995-3,072 ft., T.D. 3,120 ft.
Pawnee County: J. P. Brady 1-B Bellis, SE NW SE 28-20-9, pumped 10 bbl., Wilcox 2,754-70 ft.
Tulsa County: J. B. Charles 1 Sheehan, N½ SW 4-22-14, dry, T.D. 406 ft.

Southwest Texas

(Continued from Page 77)

pany is scheduled to start a Wilcox test within 90 days. In the meantime, location for a Pettus sand test was made about 9 miles west of Beeville by Ike Howeth who is rigging up for 1 Homer Harris in the Cayetano Rivas grant. This is a 4,800-ft. test and is being supported by Pan American and American Republic Corp.

Shield Oil Co., 1 Ira Heard, the discovery well of a gas-distillate field, 9 miles northeast of Skidmore, Bee County, is shut in to install separator equipment after the well flowed an unestimated amount of gas and distillate from the Pettus sand at 4,855-65 ft. Tubing pressure was 1,650 lb., and casing pressure 1,475 lb.

In the new McLean field, Webb County, two more pumping wells were completed, both by O. W. Killam. No. 2 McLean pumped 165 bbl. daily from sand at 3,223-32 ft., and 3 McLean pumped 190 bbl. daily from sand at 3,226-36 ft. The operators' 4 McLean is bottomed at 3,242 ft., and 5½-in. casing was cemented at 3,222 ft.

SOUTHWEST TEXAS COMPLETIONS

LOWER GULF COAST DISTRICT

Wildcats

Aransas County: Humble 1 Kent & Crane, dry at 11,798 ft.

Fields

Agua Dulce, Nueces County: F. A. Gillespie 1 Von Blucher, 72 bbl., gas lift, perf. casing 7,256-61 ft., T.D. 7,316 ft.
R. H. Hawn 3-D Wofford, 236 bbl., ¼-in. choke, perf. casing 7,012-25 ft., T.D. 7,057 ft.
Pan American 1 Aetna Life Insurance Co., 42 bbl. ¼-in. choke, perf. casing 6,410-13 ft., T.D. 7,202 ft.
Odem, San Patricio County: Seaboard 5 Lane, 1,000,000 cu. ft. gas open flow. perf. casing 5,327-29 ft., T.D. 5,511 ft.
Orange Grove, Jim Wells County: Kilgore Developers 2 Kuck, 73 bbl., 6/64-in. perf. casing 5,097-99 ft., T.D. 5,103 ft.
Premont, Jim Wells County: J. G. Storm 1 Laughlin, dry at 4,550 ft.
Seeligson, Jim Wells County: Magnolia 27 Seeligson, 77 bbl., 7/64-in. choke, perf. casing 6,098-6,101 ft., T.D. 6,237 ft.
Sun 5 Canales, 153 bbl., 7/64-in. choke, perf. casing 5,988-92 ft., T.D. 6,010 ft.
Sun 3 Miller, 184 bbl., 7/64-in. choke, perf. casing 5,968-72 and 5,978-80 ft., T.D. 6,006 ft.
Transwestern 9 Dunlap, 83 bbl., 5/64-in. choke, perf. casing 5,927-32 ft., T.D. 6,250 ft.

LAREDO DISTRICT

Wildcats

Starr County: Coastal Refineries 1 Guerra, dry at 3,588 ft.
Quinto 1 A. K. Bass, dry at 1,054 ft.
Webb County: Bedwell O'Neil 1 Bruni, dry at 2,002 ft.

Fields

Colorado, Jim Hogg County: Humble 56-B King, 44 bbl., 3/16-in. choke, T.D. 3,032 ft.
Elidos, Hidalgo County: Arkansas 1 J. W. Heard, 1,250,000 cu. ft. gas and 12 bbl. distillate. 5/32-in. choke, perf. casing 6,020-26 ft., T.D. 6,813 ft.
Hoffman, Duval County: Magnolia 26 Well, 49 bbl., pumping, sand 2,690-95 ft.
McLean, Webb County: Magnolia 1 McLean, 220 bbl., pumping, sand 3,251-56 ft., T.D. 3,256 ft.
Magnolia 2 McLean, dry at 3,535 ft.
North Sun, Starr County: Sun 2-S Montalvo, 124 bbl., ⅛-in. choke, perf. casing 4,907-14 ft., T.D. 5,450 ft.
Sun, Starr County: Humble 3 Saenz, 112 bbl., ¼-in. choke, T.D. 4,650 ft.

SAN ANTONIO DISTRICT

Wildcats

Bastrop County: Banks L. Miller 1 William, dry at 3,021 ft.
Lee County: M. M. Miller & Sons 1 Smith, top Wilcox 2,850 ft., dry at 5,812 ft.

Fields

Carroll, Bastrop County: H. H. Coffield 9 Carroll, dry at 2,310 ft.

Sejita Field, Duval County, Is Latest to Find Flank Oil

(Continued from Page 67)

lower on the Jackson and approximately 331 ft. lower on the Hockleyensis. The upper gas sands were found to have pinched out, and the only gas shows encountered were logged at 5,740-44 ft. Salt water sand was topped at approximately 5,877 ft., and was cored at intervals to the total depth.

Potentialities Large

While further development will have to be done before the importance of this new strike can be accurately measured, the initial flow of the well and the thickness of the sand indicates that production will extend over a considerable area. Most of the acreage around the fringe of the unitized area is held by several independent and major companies, and an increase in development is anticipated. With the exception of one 6,500-ft. dry hole located on the southeast flank, possibilities of uncovering additional production around the flanks of the structure are undetermined.

The discovery of crude production at Sejita is typical of recent development in Southwest Texas, While the possibility of production from downdip sands flanking gas-distillate structures has been recognized for some time, it has been only within the past few years that any real attempt was made to explore the flanks of such structures.

The importance of this type of development was emphasized in 1939 with the opening of crude production on the Rincon field, Starr County, and more recently at the Agua Dulce-Stratton structure in Nueces County. Subsequent development has proven these structures to be the largest in the district, and the fields are not yet limited by failures.

In addition to the above fields, important production was opened the past year at La Gloria, Jim Wells County; Odem, San Patricio County, and the La Reforma structure in Starr County. Exploration, particularly along the Frio-Vicksburg trend, continues to open new gas-distillate structures, and these are now generally recognized as undeveloped oil reserves in light of recent development.

Nebraska-Missouri

(Continued from Page 80)

went on pump and was pulling about 100 bbl. per day. Since the production was limited to that amount to comply with federal restrictions there was no test for potential.

The company staked location for a semiwildcat well about ¾ mile east of Power Oil Co. 2 Albin in the Dawson pool of Richardson County.

Towle & Isaacks were about to perforate casing at their 1 Sibbernsen on the east edge of the Falls City pool.

NEBRASKA COMPLETIONS

Barada, Richardson County: Skelly 2 Fred Merz, E½ SE NE 35-3n-16e. pumped 100 bbl., Hunton, T.D. 2,478 ft.
Skelly 2 Steinbrink, W½ NE NW 36-3n-16e, pumping, Hunton 2,441-44 ft.

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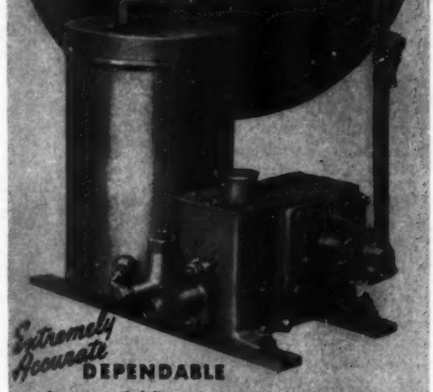

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THE OIL AND GAS JOURNAL

Personal Paragraphs

AUDLEY H. HARNSBERGER, Chicago, Ill., a veteran with Pure Oil Co.'s refinery division, has been appointed chairman of the company's refinery control board. He succeeds CARY R. WAGNER, who is now a member of the OPC's Refinery Division staff in Washington, D. C.

J. A. LYON, chief petroleum engineer for the Texas Railroad Commission in District 3, has resigned to open consulting offices at Houston, Tex. Mr. Lyon has been associated with the commission since June 1937 and was made chief engineer in the Houston district in 1940.

S. F. SHAW, consulting engineer of San Antonio, Tex., has been in western Kentucky examining fluor spar deposits.

C. D. WATSON, proration engineer for Carter Oil Co., Tulsa, is temporarily stationed at Washington, D. C., on company matters.

WILLIAM BUECH, former Oil City, Pa., resident, addressed the Oil City Lions Club, on Ecuador, where he has served as geologist for several years.

L. J. FRODIN has been appointed office manager of the Whiting refinery of Standard Oil Co. of Indiana, succeeding JOHN CATHERALL who has been transferred to other duties. CLAUDE YATES has been appointed assistant office manager.

HARRY N. HOLMES, president of the American Chemical Society, will speak at Amarillo, Tex., March 14, before the Panhandle chapter of the organization. He is head of the chemistry department of Oberlin College.

H. C. VICTORY, division land man in the New Orleans, La., division for the Humble Oil & Refining Co., resigned March 1 and has been succeeded by A. D. HUNTER, formerly district land man at Mobile, Ala. FORD GRAHAM succeeds Mr. Hunter at Mobile.

J. E. BAILEY has been transferred from Houston by Tide Water Associated Oil Co. to Kilgore, Tex., where he holds the position of division engineer for East Texas. He will replace E. B. MILLER, JR., who has been appointed superintendent of the company's properties in the Wichita Falls, Tex., district.

J. S. WALTON, professor of chemical engineering, University of Oklahoma at Norman, has been made director of an industrial fellowship, for the study of properties of various hydrocarbons, supported by the Standard Oil Development Co.

EARL FRENCH of Freedom Oil Co. has been elected president of the California Lubricating Oil Manufacturers and Marketers Association and FRANK REED of Master Lubricants Co. was elected vice president. WARREN G. BROWN of Paroline Refining Co. was elected treasurer and HARVEY E. HARRIS was elected secretary.

HARRY O. BOONE has joined the Mid-States Oil Corp. at Houston, Tex., as scout in the Gulf Coast district.

J. N. WILSON, formerly field engineer in the Hull, Texas, district for the Texas Co., has been promoted to district engineer for the same area.

CHARLES J. BRADLEY, formerly scout for the Texas Co. in the East Texas district, with headquarters at Tyler, Tex., has been promoted to district land man.

H. A. LAPHAM has been appointed supervisor of economics and planning, refining department of Union Oil Co., succeeding E. G. RAGATZ, who has resigned to enter business for himself.

D. A. MOORE of Wilshire Oil Co. and president of the Los Angeles Petroleum Accountants Society has appointed MILTON G. KERR of Union Oil Co., chairman of the evening for the next monthly meeting, and the latter has selected CHARLES W. PIERCE of Jergins Oil Co.; R. H. BARR, Wilshire Oil Co.; J. R. BROWN, Standard Oil Co.; H. A. LAPHAM of Union Oil Co. and R. A. BROOKS of General Petroleum Corp. to form a symposium on the Preference Rating Order P-98 and other kindred issues.

MORRIS G. SPENCER has been elected president of the Las Tecas Petroleum Co., Victoria, Tex.

EUGENE STEBINGER has been transferred from the production department to become chief geologist of the Standard Oil Co. (New Jersey).

T. C. HIESTAND has been appointed regional geologist for Cities Service Oil Co. with headquarters at Bartlesville, Okla. He was formerly with Indian Territory Illuminating Oil Co.

EUGENE FISHER, petroleum engineer for the Stanolind Oil & Gas Co., has been transferred from Fort Worth to the North Cowden field, near Odessa, Tex., where he will serve as production foreman.

JOHN RUPERT, Oil City, Pa., has returned to Cartagena, Colombia, where he is employed by the Andian National Corp., pipe line subsidiary of International Petroleum Co. Mrs. Rupert and their daughter, Sylvia Ann, accompanied him.

J. PAUL GETTY, Los Angeles, Calif., president of George F. Getty, Inc., has become president and general manager of the Spartan Aircraft Co., Tulsa, succeeding WILLIAM G. SKELLY, president of Skelly Oil Co., who resigned to devote undivided attention to petroleum affairs.

R. A. STEINMAYER, associate professor of geology at Tulane University, New Orleans, La., last week proposed a defense pipe line that would originate in Wyoming, terminate at Washington, D. C., with feeders from the Southwest and Mid-Continent fields. Other branches on the eastern terminal would serve New York, Philadelphia and Baltimore, Md., refining centers.

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

Sale of Pure Oil Co., a Pennsylvania company, operating in Louisiana, Oklahoma, Illinois and Pennsylvania, to Doherty interests for $25,000,000 is confirmed.

Atlantic Petroleum Corp. is organized by group of Tulsa oil men headed by H. N. Gries to operate the merged properties of Curtis & Aiken, Burke-Hoffield Oil Co. and various other independent companies. New company has daily production of 6,000 bbl. with 75,000 acres of leases in Oklahoma and Kansas.

Midwest Oil Co. completes negotiations for acquisition of nine Reed companies and the Fitzhugh holdings in the Salt Creek field in Wyoming representing more than half of the proved productive area of the field. Purchase involved $8,000,000.

20 YEARS AGO

First annual convention of Western Petroleum Refiners Association is held at St. Charles Hotel, New Orleans, La., with several hundred members present.

Holdings of the Humphreys-Mexia Co. and the Humphreys-Texas Co. are merged under single ownership of Humphreys Oil Co., a newly formed $15,000,000 company headed by Col. A. E. Humphreys.

10 YEARS AGO

J. B. Aug. Kessler, one of the managing directors of the Royal Dutch, suggests revival of the Export Petroleum Association as the medium for cooperation between the American oil industry and foreign interests. The plan is intended to raise the price of fuel oil to $1 and gasoline to 8 cents.

The Oklahoma price for gasoline is 3¼ cents while fuel oil is selling at 25 cents.

After 8 months a spectacular oil-field fire in Rumania has been extinguished by M. M. Kinley, fire fighter of Tulsa.

W. W. HEATHMAN, Los Angeles, Calif., has been made manager of Union Oil Co. of California's new office in the Union National Bank Building.

L. A. HART, vice president of the Chicago Oil Co. in Dallas, Tex., is leaving to take a position as industrial specialist in the Quartermaster Corps of the Army in Washington.

D. A. DECHMAN, production engineer for the Cities Service Oil Co., Houston, Tex., returned last week from an extended inspection trip through the West Texas district.

LINDSEY MORGAN has been appointed district geologist at Mattoon, Ill., for Cities Service Oil Co. Mr. Morgan is the son of THEO MORGAN, conservation director of Kansas.

J. TAYLOR FLY, former head of the legal division of the Standard Oil Co. of Argentina, has been transferred to the parent concern, Standard Oil Co. (New Jersey), and assigned to duties in New York.

D. A. SILLERS, Dallas, Tex., superintendent of Lone Star Gas Co.'s measurement department, has been appointed chairman of the gas measurement subcommittee, Production Division, American Petroleum Institute.

FRANK E. WILDER, in charge of Socony-Vacuum Oil Co., Inc.'s plant protection since July 1940, has received an appointment to the War Department, directing all such work for oil. He has the rank of major. Major Wilder graduated from West Point in 1923 and saw 3 years' service in the Army before entering Socony-Vacuum's foreign service. He was in Europe at the outbreak of the war.

Shifts: F. E. SHELLY, engineer, Gramps Oil & Refining Co., Alamosa, Colo., to Bay City, Tex.; EDWARD B. DANA, engineer, De Golyer, MacNaughton, McGhee, Dallas, to Midland, Tex.; C. N. VALERIOUS, Barnsdall Oil Co., Dallas, to Texarkana, Tex.; D. A. ROSS, land department, Barnsdall Oil Co., Evansville, Ind., to Corpus Christi, Tex.; S. E. KIDD, vice president, Standard Oil Co. of Louisiana, New Orleans, to Baton Rouge, La.; F. M. O'CONNOR, O'Connor Petroleum, Inc., New York City, to Barber, N. J.; R. D. SPILLE, engineer, Carter Oil Co., Brooklyn, N. Y., to Caripito, Venezuela; M. H. BOSTICK, superintendent, Herton Oil Co., Jeanerette, La., to Houston, Tex.; EDWIN J. BARTH, superintendent, Three Rivers Refinery, Three Rivers, Tex., to Chicago; J. L. HOLLIS, Seismograph Service Corp., Fairfield, Ill., to Hobbs, N. M.; M. C. SANDERS, drilling superintendent, Rogers & Rogers, Holdenville, to Oklahoma City, Okla.; J. W. GODDARD, engineer, Sinclair Prairie Oil Co., Ardmore, Okla., to Tyler, Tex.; HUGH C. SCHAEFFER, manager, United Geophysical Co., Tulsa, to Amarillo, Tex.; R. S. EPPERSON, Humble Oil & Refining Co., San Angelo to Schulenburg, Tex.; TOM GERALD, drilling superintendent, Noble Drilling Co., Apache to Madill, Okla.; C. C. WEAVER, engineer, Sun Pipe Line Co., Humble to Mont Belvieu, Tex.; MARK D. JACKMAN, drilling superintendent, Bert Fields, Mount Vernon, Ill., to Fosteria, Tex.; W. B. ALEXANDER, drilling superintendent, Zephyr Drilling Co., Winfield, Kans., to Ada, Okla.; ELMER RUTHERFORD, drilling superintendent, Roy Guffey Drilling Co., Gainesville to Falfurrias, Tex.; T. C. WILSON, geologist, Atlantic Refining Co., Managua, Nicaragua, to Venezuela Atlantic Refining Co., Caracas Venezuela; LT. CHARLES E. KNOX, JR., superintendent, Knox Refining Co., Norman to Fort Sill, Okla.

Tackles Bottleneck

One of the toughest jobs at the disposal of the Office of Petroleum Coordinator has been assigned to Maj. J. R. Parten, of Houston, Tex., president of the Woodley Petroleum Co., chairman of Premier Oil & Refining Co., and until this week a member of the Tanker Control Board at Washington.

MAJ. J. R. PARTEN

Major Parten is to become director of transportation for OPC, a division of operations that is currently receiving the concentrated attention of the entire petroleum industry and federal officials.

His experience in the oil business dates from conclusion of World War 1. In turning his interests to the petroleum industry, Major Parten rejected what promised to be an exceptional military career. He left the University of Texas, where he studied law and science, at the age of 19 and entered the second officers training camp at Leon Spring in the summer of 1917. He was offered command of military training at Harvard University but elected to try the oil business at Shreveport, La.

Major Parten succeeded in developing production in Louisiana and Arkansas during his first 5 years in the business and in 1922 his holdings and others were consolidated under his supervision, forming the nucleus for what later became the Woodley Petroleum Co. He became president of Woodley in 1933.

During the late 20's and early 30's, Major Parten was active in framing Texas oil statutes while serving as president of the old Independent Petroleum Association of Texas. His interest in affairs of Texas University has continued during his business career and he was appointed to the board of regents in 1935.

Woodley Petroleum Co. operates producing properties in East Texas, Southwest Texas, and the Gulf Coast of Texas and Louisiana. Premier Oil & Refining Co., has operating refineries at Longview (Willow Springs), Fort Worth, Tex., and Cotton Valley, Louisiana. The company recently consummated a contract with the Defense Plants Corp., for construction of a 100-octane gasoline plant at Cotton Valley.

R. K. FRANKLIN is representing S. F. Bowser & Co., Inc., in the Mid-Continent area with headquarters at Tulsa.

JOHN R. CRANDALL, junior engineer with Humble Oil & Refining Co., is now stationed at Randolph Field, Texas, as aviation cadet.

JACK LEVERING, field representative for Stanolind Oil Purchasing Co., Houston, Tex., is now on duty at the U. S. Naval Station, New Orleans, La.

HENRY CAPPEAU, Tulsa, geologist for Atlantic Refining Co., reported at Fort Sill, Okla., March 6, for active military service in the field artillery.

SAMUEL H. RIGGS, attorney who went from Indian Territory Illuminating Oil Co. to Cities Service Oil Co. at Bartlesville, Okla., has been made head of the legal department of the marketing division at Chicago.

MIKE DILLINGHAM, field superintendent for the Nueces Corp., Corpus Christi, Tex., is now lieutenant with the Sixtieth Coast Artillery, stationed in San Diego, Calif.

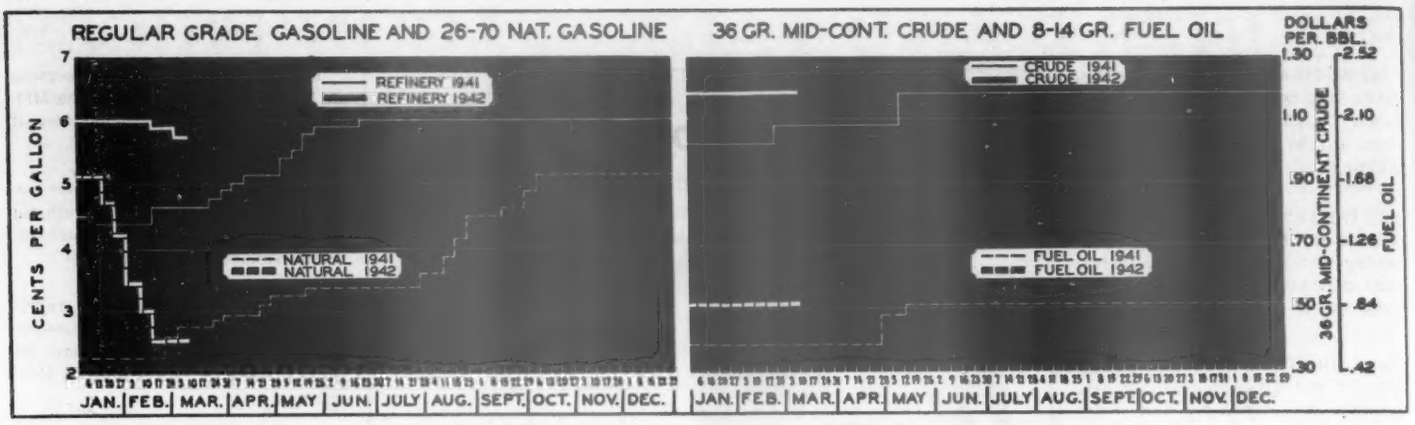
THOMAS B. MORROW, junior engineer with the Shell Oil Co., Inc., is now serving as first lieutenant in the 721st Ordnance Co., Air Base Camp, Bakersfield, Calif.

CHARLES H. McNEESE, chief valuation engineer of the Continental Oil Co., Ponca City, Okla., a lieutenant colonel in the Officers Reserve Corps., has been ordered to active Army service effective March 22 when he will report to Camp Banning, Ga. Colonel McNeese is one of Continental's veteran employes.

SHELBY E. KIDD, secretary and treasurer of Standard Oil Co. of Louisiana, his assistant W. B. COTTEN, JR., and employes of the department, were transferred from New Orleans to Baton Rouge, La., March 1. Others transferred were J. W. SUTHERLAND, T. G. LEWIS, E. B. STATHEM, F. W. ROHRBOUGH, G. M. McCUIN, J. D. TOLER, M. E. McCARRON and MISSES A. CLEVELAND and R. TEDDLIE.

W. H. FERGUSON, Denver, Colo., executive vice president of Continental Oil Co., and general chairman of OPC's District 4, who has been absent from his office for several weeks on account of illness, is again back at his desk.

HENRY EMMETT GROSS, associate professor of petroleum engineering at Texas Agricultural and Mechanical College, has been appointed assistant petroleum analyst in the Chicago Office of the Petroleum Coordinator for National Defense. Mr. Gross was formerly on the staff of the University of Oklahoma, and had worked for Shell Oil Co., Inc., and Pacific Western Oil Co. He is a graduate of Missouri School of Mines and has a master's degree from the University of Illinois.



MARKET DEVELOPMENTS . . .

East Coast

NEW YORK, Mar. 10.—Despite the fact that rail shipments of crude oil and refined products to the East Coast again exceeded an average of 10,000 cars per day, another substantial decline in stocks occurred in the last week of February. The continued decline in stocks despite the extensive effort to supply this market by alternative measures emphasizes the immediate need for some form of rationing that will effect a reduction in consumption. Proposed measures, such as closing service stations each night and on Sundays, are not expected to prove adequate.

One proposal put forward last week to reduce tanker losses would further reduce deliveries by this means if adopted. This suggestion is that since the vast majority of attacks have been undertaken at night tankers should put into port each night and sail only during the day. Official Navy reports put the loss of tankers in the Atlantic and Caribbean up to March 7 at 21.

The seriousness of the situation that confronts the East Coast is apparent from a comparison of stocks as of February 28, 1942, with those of the same date a year ago. The comparison follows:

(Thousands of barrels)

Product—	Feb. 28 1942	Feb. 28 1941
Gasoline	19,027	20,082
Distillates	8,397	14,570
Residual	7,376	9,846
Crude oil	9,573	12,104
Total	44,373	56,602

These figures show a decline of more than 12,000,000 bbl. The disparity is emphasized by the greater demand for all products that is being experienced this year.

Adoption of the tanker allocation plan has provided relief for those distributors who were in more difficult position than others but offers no solution to the over-all problem of supply.

Mid-Continent

PRESSURE of higher stocks within the area and from neighboring districts where conditions are in an acute stage of distress this week weighed on refinery gasoline prices in the Mid-Continent. Prices quoted by a majority of refiners declined 0.125 cent per gallon and even lower figures were reported quoted by a few sellers.

In addition to the higher stocks of gasoline reported from most refining centers, the soft market for natural gasoline and sympathetic offerings of recycle distillate reacted unfavorably on refinery motor fuel. The curbs on consumption resulting from the rubber shortage are becoming a more important factor in Middle West marketing operations, according to information reaching refiners. The threat of rationing on a national basis is also tending to convert car owners to use of public transportation facilities.

Meanwhile, the market for fuel oils of all grades continued strong and supplies were difficult to locate. The fuel-price strength extended from kerosene down through industrial oils.

Natural-gasoline prices remained unchanged at the level of 2.25 cents per gallon in Oklahoma (Group 3 basis) and 2 cents in North Texas. Sales were reported to have gained slightly as jobbers came into the market to purchase supplies direct. Shipments have not reached sufficient volume and inquiries are not adequate to lift prices upward. Material available for northern movement is still freely offered because of an abrupt cessation of shipments to the Gulf Coast. Practically all natural gasoline normally moving south to satisfy Gulf Coast demand for refinery blending and for coastwise movement is now backing up through the Middle West territory, creating a surplus of supplies for the interior market.

Removal last week of the price ceiling on aviation gasoline of 91 octane and higher, including exemption of components that go into manufacture of motor fuels of that quality, removes some of the restraint on refinery products. Straightrun gasoline of high octance value is among the products exempt, providing it is used in the manufacture of aviation fuel. The modified price regulation is designed to increase production of aviation fuel.

SENTENCE SUMMARIES

MID-CONTINENT: Refinery gasoline has declined 0.125 cent per gallon, yielding to selling pressure.

EAST COAST: Stocks continue downward. Tanker pooling plan may aid in equalizing distribution.

GULF COAST: Tone of fuel-oil market firms. Refinery gasoline continues soft. No sales reported.

PACIFIC COAST: Prices are steady, although movement of gasoline is strictly routine.

PENNSYLVANIA: All markets are firm. Refiners shipping surplus products to seaboard points.

A.P.I. REFINERY REPORT

Week ended February 28, 1942

(Figures in thousands of barrels)

	Dly. crude runs to stills	Stocks Gasoline	Residual	Gas oil
East Coast	565	19,027	7,376	8,397
Appalachian	157	3,719	588	376
Ind., Ill., Ky.	692	22,548	3,959	3,092
Okla., Kans., Mo.	342	10,474	1,952	921
Inland Texas	184	3,604	1,203	80
Texas Gulf	883	20,688	9,369	7,574
Louisiana Gulf	158	4,675	2,264	1,581
N. La. and Ark.	83	1,212	281	103
Rocky Mtns.	82	2,417	617	303
California	529	17,271	60,676	12,120
Total Feb. 28, 1942	3,675	105,635	88,285	34,547
Total Feb. 21, 1942	3,889	104,312	88,899	35,698
Total Mar. 1, 1941	3,561	95,646	95,945	34,875

Note: Refinery runs and stocks for week ended March 7, 1942, appear on Trends page.

CRUDE-OIL STOCKS

(Bureau of Mines estimate)

Week ended:	Bbl. of crude*
February 28, 1942	259,373,000
February 21, 1942	255,881,000
March 1, 1941	263,176,000

*Excludes heavy, unrefinable crude in California.

Gulf Coast

HOUSTON, Tex., Mar. 10.—Strengthening of fuel-oil prices by increased movement of material in tank cars and tankers was felt in the Gulf Coast refinery market this week. Although details as to how much material was moved were not available, quotations were pushed upward to their former position and no large quantities of distress material were reported. No. 2 fuel which had been quoted at 3.875 was reported firm at 4 cents with stocks limited. Bunker C fuel previously reported moved as low as 82 cents was reported firm at 85 cents.

Firmer fuel-oil prices have been anticipated for some time due to the increased demand on the East Coast, but movement has been delayed by the shortage of tankers, and sellers, overstocked with material, were inclined to shade prices after the expected increase in movement failed to materialize. Movement of material by tankers is the first to be reported in several weeks. Details as to how much material is being lifted were not available. There are indications, however, that the situation is being gradually improved, pointing to a firmer market.

In reporting inventory of stocks March 1, the Gulf Coast Refiners Association showed a total of 2,350,533 bbl. of refined gasoline on hand, an increase of 112,877 bbl. since February 15. Stocks of diesel gas oils were decreased 35,000 to 520,040 bbl. Light fuel oils were decreased 113,973 bbl. to 1,192,232 bbl. Crude runs amounted to 1,435,812 bbl., an average of 110,447 bbl. per day, or 67.5 per cent of capacity. Total products on hand were increased 81,642 bbl. to a total of 5,530,885 bbl.

Lubricants were in good demand and prices were generally firm.

REFINERY AND TANK-WAGON PRICES

(Prices as of March 10)

Refinery Gasoline

Octane (A.S.T.M.):	†80	78	74-76	72-74	68-70	63-66	60 & lower
Mid-Continent*				5.625-5.875		5.250-5.500	4.875-5.125
Pennsylvania			6.750-7.000				
Gulf Coast‡	6.00-6.50			§5.750-6.250	§5.750-6.250	§5.250-5.750	§5.000-5.500
Northeast Coast				8.300	8.300		
Pacific Coast		7.000-7.500	6.750-6.875	6.500-6.750	6.250-6.500	6.000-6.500	5.000-5.750

*Basis Group 3. †1939 C.F.R. (research method). ‡Integrated companies restricted to lowest prices. §Unleaded.

Quotations are f.o.b. plant in cars and in cents per gallon except where otherwise noted. They are exclusive of the federal excise taxes of 1.5 cents a gallon on gasoline and 4.5 cents a gallon on lubricating oils, and do not include marine lighterage charges.

Natural Gasoline

Grades:	26-70	18-55	75-85(350-375)
Oklahoma (Group 3)	2.250	2.625-2.750	
North Texas	2.000	2.375-2.500	
North Louisiana	2.125	2.500-2.625	
California			4.750-5.000

Kerosene and No. 1 Fuel Oil

Gravity:	46	45	42-44	41-43	38-40
Mid-Continent*			4.500-4.750	4.375-4.625	
North Louisiana			4.625-4.750		
Pennsylvania	6.250	6.125-6.250			
California				4.500-6.000	4.500
Northeast Coast				5.300	
Gulf Coast				3.875	

*Basis Oklahoma Group 3.

Tractor, Diesel, and Bunker Fuel Oil

Specifications:	46-48° G.	24 D.I.	48-52 D.I.	58 & above	Diesel bunkers	Bunker C
Mid-Continent*	4.125					
California		2.750-4.000			‡$1.35-1.45	$0.80-0.90
Gulf Coast			4.000	4.125	1.45	0.85
Northeast Coast				5.200	2.15	1.35
North Louisiana						†0.80-0.85

*Basis Oklahoma Group 3. †10-14° gravity. ‡Pacific Specification 200.

Furnace Oil, Gas Oil, Fuel Oil

	No. 2	No. 3	No. 5	No. 6
Mid-Continent*	3.500-3.625	3.375-3.500	$0.85	$0.85
Pennsylvania (West)	5.625-5.875	5.375-5.875	†5.250-5.500	
Northeast Coast	5.2	5.2	1.65-75	1.35
Pacific Coast	5.5	5.5	‡0.75-95	$0.80
Gulf Coast	3.875-4.0		1.65	0.85

*Basis Oklahoma Group 3. †36-40 gravity fuel oil. ‡Pacific Specification 300. §Pacific Specification 400.

Lubricating Oils

Bright and Steam Refined

OKLAHOMA (Group 3)—		
200-210 D, 10-25		27.00
150-160 D, 0-10		23.00
120-125 D, 0-10		22.00
Steam refined:		
600 dark green (untreated)	9.00	9.50
PENNSYLVANIA—		
Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pour point		30.50
15 pour point		29.50
25 pour point	25.00	28.00
Steam refined:		
600	15.00	16.00
650	15.50	16.50
600 flash	16.00	17.50
650 flash	17.00	17.50

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—	
0-10 pour point:	
200-3	15.00
300-3	18.00
500-3	19.50
600-3	20.00

Note: Viscous neutrals, 10-25 pour, quoted 0.5 cent under 0-10 oils.

Wax

(Cents per pound)

OKLAHOMA (Group 3)—	
124-126 (A.m.p.) w.c. scale	4.350-4.550
PENNSYLVANIA (inland refineries)—	
122-124 (A.m.p.) w.c. scale	4.250
124-126 (A.m.p.) w.c. scale	4.250

Neutral Oil

CALIFORNIA—		
Pale oils:		
200-2½-3	7.00	7.75
400-3-4	7.25	8.00
600-3-4	8.75	11.00
Red oils:		
200-4-5	7.00	7.75
400-5-6	9.00	11.00
500-900, 5-6½	9.25	11.25
GULF COAST—		
Pale oils:		
200-3	8.50	8.75
300-3	9.00	9.25
500-3½	9.75	10.00
750-3½	10.00	10.25
2,000-4	10.50	10.75
3,000-4	12.25	12.50
PENNSYLVANIA—		
150 vis. at 70° F., 3 color, 400-405 flash:		
Zero pour point		38.50
10 pour point		37.50
15 pour point		36.50
25 pour point		31.00
200 vis., at 70° F., 3 color:		
Zero pour point		40.50
10 pour point		39.50
15 pour point		38.50
25 pour point		33.00
NEW YORK—		
Wax in bags fully refined:		
130-132 (A.m.p.) wax		6.250
133-135 (A.m.p.) wax		6.550
Crude scale:		
124-126 (A.m.p) w.s.		4.350-4.455
124-126 (A.m.p.) y.s.		4.350-4.455

Crude-Oil Prices

(Complete crude-price tables are published in the first issue of each month.)

Shell Oil Co., Inc., has posted a price of $1.25 per barrel for the new Mercy field, San Jacinto County, Texas.

Representative selected crude prices from all sections of the country appear below:

East Texas	$1.25
Conroe	1.43
Tepetate, Louisiana	1.18
Smackover, Arkansas, heavy	.83
Illinois basin	1.37
Pecos County, Texas	.95
Lance Creek, Wyoming	1.12
Bradford, Pennsylvania	2.75

Gravity Schedules

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

Gravity	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast, Texas	West Texas*
18-18.9	$0.80	...	...	...
19-19.9	.84	...	$1.06	$0.70
20-20.9	.88	$0.85	1.08	.72
21-21.9	.92	.87	1.10	.74
22-22.9	.96	.89	1.12	.76
23-23.9	1.00	.91	1.14	.78
24-24.9	1.03	.93	1.16	.80
25-25.9	1.07	.95	1.18	.82
26-26.9	1.11	.97	1.20	.84
27-27.9	1.15	.99	1.22	.86
28-28.9	1.18	1.01	1.24	.88
29-29.9	1.20	1.03	1.26	.90
30-30.9	1.23	1.05	1.28	.92
31-31.9	....	1.07	1.30	.94
32-32.9	....	1.09	1.32	.96
33-33.9	....	1.11	1.34	.98
34-34.9	....	1.13	1.36	1.00
35-35.9	....	1.15	1.38	1.02
36-36.9	....	1.17	1.40	1.04
37-37.9	....	1.19	1.42	1.06
38-38.9	....	1.21	1.44	1.08
39-39.9	....	1.23	1.46	1.10
40 and above	....	1.25	1.48	1.12

*Includes Lea County, New Mexico.

EXPORT PRICES

Gasoline—60-62° Gravity, Maximum 400 End Point

Octane:	72-74	68-70	65-66	60
Gulf Coast	6.500	6.250-6.500	5.875	5.625
Pacific Coast		6.125-6.500	5.875-6.000	5.500-5.625

Distillate and Fuel Oil

	Kerosene	Diesel fuel				Bunker
	41-43	24 G.	48-52 D.I.	58 D.I.	Bunkers	C grade
Gulf Coast	4.000-4.250	....	4.125-4.375	4.375	$1.65-80	$0.85-95
Pacific Coast	4.750-5.000	1.25-30	....	....	†1.35-45	*0.80-90

*Pacific Specification 400. †Pacific Specification 200.

Lubricating Oils

	Neutral oils		Bright and cylinder stocks		
	200-3	150-3	200-3	150-3	600&630 S.R.
Mid-Continent	16.8		28.8	24.8	
Pennsylvania	43-50	41-46	36-37	36-37	26.5-27

GASOLINE AND KEROSENE TANK-WAGON PRICES IN 50 CITIES

(Gasoline prices based on regular grades, tax included, undivided dealer)

ATLANTIC AND NEW ENGLAND

(Socony-Vacuum Oil Co., Inc., and Atlantic Refining Co.)

	Dealer tank wagon	Combined tax	Kero-tank wag.
Baltimore, Md.	14.55	5.50	8.70
Boston, Mass.	14.00	4.50	8.00
Burlington, Vt.	16.00	5.50	....
Buffalo, N. Y.	15.30	5.50	8.80
Dover, Del.	15.80	5.50	10.50
Hartford, Conn.	14.70	4.50	....
Manchester, N. H.	16.40	5.50	9.00
Newark, N. J.	13.80	4.50	7.90
New York, N. Y.	15.20	5.50	8.00
Philadelphia, Pa.	15.30	5.50	10.15
Pittsburgh, Pa.	15.80	5.50	10.50
Portland, Me.	15.40	5.50	8.10
Providence, R. I.	14.10	4.50	7.80
Washington, D. C.	13.80	3.50	9.20
Average 14 cities	15.07	5.07	8.89

(All prices undivided dealer basis.)

CENTRAL

(Standard Oil Co. of Indiana, Standard Oil Co. of Ohio, Continental Oil Co. and Texas Co.)

	Dealer tank wagon	Combined tax	Kero-tank wag.
Chicago, Ill.	14.10	4.50	10.30
Cleveland, Ohio	15.00	5.50	*9.00
Dallas, Tex.	13.00	5.50	7.00
Des Moines, Iowa	11.90	4.50	9.80
Detroit, Mich.	14.40	4.50	9.60
Fargo, N. D.	16.90	5.50	11.30
Huron, S. D.	16.30	5.50	10.70
Indianapolis, Ind.	15.20	5.50	9.80
Little Rock, Ark.	17.50	8.00	10.00
Milwaukee, Wis.	16.10	5.50	10.50
Minneapolis, Minn.	15.40	5.50	10.30
Omaha, Neb.	15.40	6.50	9.80
Tulsa, Okla.	16.50	7.00	8.50
Wichita, Kans.	12.70	4.50	8.00
Average 14 cities	15.03	5.57	9.61

*Includes 1-cent state tax.

SOUTHEASTERN

(Standard Oil Companies of New Jersey, Kentucky and Louisiana)

	Dealer tank wagon	Combined tax	Kero-tank wag.
Atlanta, Ga.	18.50	7.50	9.00
Birmingham, Ala.	19.60	8.50	9.00
Charleston, S. C.	18.05	7.50	....
Charleston, W. Va.	18.35	6.50	11.50
Charlotte, N. C.	19.20	7.50	9.50
Jacksonville, Fla.	18.50	8.50	8.00
Jackson, Miss.	18.00	7.50	8.50
Louisville, Ky.	17.00	6.50	8.50
Memphis, Tenn.	17.75	8.50	10.50
New Orleans, La.	17.25	8.50	*10.00
Norfolk, Va.	16.55	6.50	10.20
Average 11 cities	18.07	7.59	9.47

*Includes 1-cent state tax.

MIDWESTERN

(Continental Oil Co.)

	Dealer tank wagon	Combined tax	Kero-tank wag.
Albuquerque, N. M.	17.50	7.50	10.00
Boise, Idaho	20.10	6.50	16.50
Casper, Wyo.	17.00	5.50	12.00
Denver, Colo.	14.50	5.50	11.00
Helena, Mont.	17.00	6.50	13.00
Phoenix, Ariz.	18.50	6.50	12.50
Reno, Nev.	17.50	5.50	13.50
Salt Lake, Utah	18.50	6.50	14.50
Average 8 cities	17.58	6.25	12.88

PACIFIC COAST

(Standard Oil Co. of California)

	Dealer tank wagon	Combined tax	Kero-tank wag.
Portland, Ore.	17.00	6.50	13.50
San Francisco, Calif.	14.50	4.50	11.50
Seattle, Wash.	17.00	6.50	13.50
Average 3 cities	16.17	5.83	12.83
Average 50 cities	16.17	5.96	10.15
Average last week	16.14	5.96	9.87

Tank-Wagon Changes

Standard Oil Co. of Louisiana reduced the tank-wagon price of kerosene 0.5 cent per gallon at New Orleans, La., effective February 2, lowering the quotation to 10 cents per gallon, including 1-cent state tax.

Tanker Rates

(Cents per barrel for coastwise trips, exclusive of 37.5 per cent surcharge permitted by Maritime Commission for war risks.)

Heavy crude and fuel (not over 19.9° gravity)	48.0
Light crude (30° gravity or lighter)	43.0
Gasoline	40.0
Kerosene	40.0
No. 2 fuel	42.0

Rocky Mountain Area

(Continued from Page 83)

Southwest Lance Creek area, Niobrara County: Cow Gulch Oil 1 Nelson, C SE SW 19-35n-65w, T.D. 6,560 ft., dry, top basal Sundance 5,080 ft., red marker 6,255 ft., first Leo 6,343 ft.

MONTANA COMPLETIONS

Cut Bank field, Glacier County: Indian Oil 2 Reickhoff, Lot 10, 3-34n-6w, T.D. 2,956 ft., good show oil in Sunburst 2,878-98 ft., 7-in. 2,901 ft., Cut Bank 2,900-45 ft., main pay 2,926-45 ft., swabbed 170 bbl.

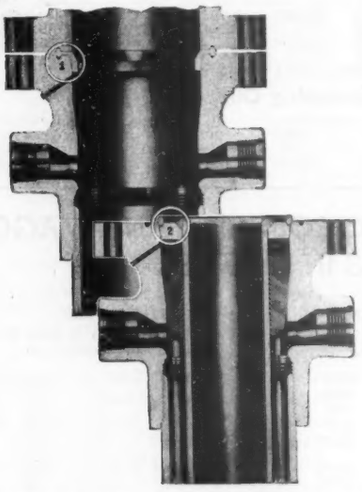
NORTHWEST NEW MEXICO COMPLETIONS

Bloomfield field, San Juan County: Goodrum 1 Reinhart, NE NE 21-29n-11w, dry at 990 ft.

EQUIPMENT PROGRESS...

Rector Provides New Head For High-Pressure Units

Rector Well Equipment Co., Fort Worth, Tex., has announced the addition of the RHX Rectorhead, for installation with high-pressure units, to its line of well-head equipment.



The RHX Rectorhead is a modification of the Type RH slip-suspension Rectorhead, to permit the use of a higher-pressure tubing head, flanged directly to a lower-pressure casing head, which, although deviating from A.P.I. standards, is recognized as an "economic expedient" by many operators. For example, the manufacturer states, a 6,000-lb.-test casing head, with 900-series flange, may be set and used during operations with blowout preventer flanged directly to it.

After oil string is set, a 10,000-lb.-test tubing head, with 900-series flang on bottom end, may be flanged directly to the casing head, using the restricted ring groove. The use of the restricted ring groove, by exposing less area to pressure than the standard ring groove for that particular flange size and series, permits the tubing head to be tested and used at the next higher pressure rating.

During drilling operations, the blowout preventer is flanged to the casing head, using standard ring groove. At this time the protector ring, as shown in Fig. 1, is in place to guard the inner ring groove from damage by bit or kelly. This ring has the same bore as the pipe, and the lip between the flanges does not interfer with the outer A.P.I. seal ring. After pipe is set, the blowout preventer is raised, slips set, and welding ring applied and welded, as shown in Fig. 2. If a weld test is desired, a double welding ring, with space between, is used so pressure may be applied through the port in the side of the head directly against weld.

By flanging the casing head and tubing head together direct, use of intermediate flanges, long bolts and two seal rings, instead of one, is eliminated with consequent conservation of material and reduction in cost of equipment left on the well. With this construction, the welding ring sets down on a solid seat in the body of the head; consequently, no strain can be thrown on the weld as bolt pressure is applied.

Rector Well Equipment Co., Fort Worth, Tex., will furnish further information on request.

TRADE LITERATURE

LEEDS & NORTHRUP CO., 4907 Stenton Avenue, Philadelphia, Pa.—Catalog N-95-163(1). This 8-page pamphlet is devoted particularly to a description of the operation of a simplified, signaling conductivity controller designed for automatic testing of condensate purity.

MACWHYTE CO., Kenosha, Wis. — A 4-page pamphlet, "Ropeology," containing a collection of wire-rope users' experiences plus much information on the science of wire-rope application in many classes of service. It includes data on care and maintenance of wire rope.

JONES & LAUGHLIN STEEL CORP., Wire Rope Division, Pittsburgh, Pa., announces a recently published booklet entitled "Rotary Line Service Record," prepared for oil drillers and contractors for the convenience of keeping a service record on the wire rope they use. Charts are included to assist in determining the ton-miles of wire rope service that result from trips in drilling operations and in setting casing or running tubing. A copy of this booklet may be obtained by writing to the Jones & Laughlin Steel Corp., Wire Rope Division, Pittsburgh, Pa.

Adjust-O-Feeders Equipped With New Fluid-Sealed Yoke

%Proportioners, Inc.%, Providence, R. I., announces that all its Adju line of Adjust-O-Feeders are now being equipped with cylinder support frames carrying the new fluid-sealed yoke, and incorporate a number of other new and improved structural features. Among these new features are:

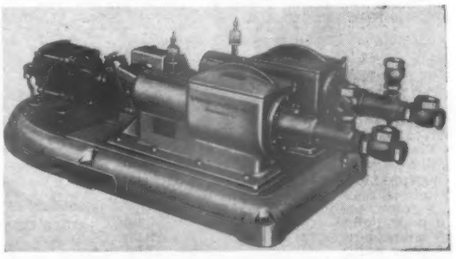
1. Micrometer stroke adjustment consisting of micrometer screw in slotted crank having large knurled thumb nuts at each end for easy and exact positioning of crank pin throw and therefore displacement capacity.

2. Driving crank equipped with shear pin to protect the speed reducer, which drives the Adjust-O-Feeder, against damage due to excess pressure when delivery line plugs up or operator accidentally closes shut-off valve.

3. Torrington needle bearings with hardened steel races on both crank-pin and wrist-bin bearings. Wrist pins are automobile standard.

4. Oversize tubular crosshead and crosshead guide equipped with drip-feed lubrication.

5. Stroke-indicator scale mounted on crosshead frame and directly attached to extension of displacement plunger. In this way, all lost motion due to play



in either the speed-reducer drive shaft or connecting-rod assembly is eliminated. Indicator shows actual plunger displacement at all times while the pump is in motion.

6. %Proportioneers% fluid-sealed yoke permitting the use of an enclosing fluid around plunger and stuffing gland. This seals these parts from contact with the air preventing destruction of the frame and working parts in the case of corrosive liquids, and build up on the plunger in the case of liquids carrying suspended solids.

7. Extra deep stuffing box with replaceable bushing permitting adjustment of depth together with Merco stick lubricator which enables the addition of packing lubricant to the rings in the stuffing box while the pump is in motion and under line pressure.

8. Specially designed interchangeable check valves with ball type, mushroom type, spherically ground and knife-edge seats and disks. Check valves are selected based on fluids to be handled.

McNAMAR TANK-TRUCK UNITS SHIPPED TO RUSSIAN GOVERNMENT . .

Petroleum Engineering Co., Tulsa, which has the contract to supply the Russian Government with additional butane and propane manufacturing and distribution facilities, has subcontracted the distribution equipment to McNamar Boiler & Tank Co., also of Tulsa.

The latter company furnished three 1,000-gal. propane truck tanks mounted on Ford 1½-ton trucks. These units were of a type that had been in service in this country for the past 3 years. They were fabricated from Hi-Tensile steel to reduce weight. Loading and unloading operations of the units are performed by Smith Precision-Chain-Drive pumps, and gallonage is determined by Smith BU 40 special propane meter.

Timken Compiles Special List of Bearings for Military Use

Early in 1941, the Timken Roller Bearing Co., Canton, Ohio, began a survey of its more than 2,500 bearing sizes to determine which ones would readily fit into the military program, increase output, and speed up delivery. Data on basic dimensions, rating, and price of 687 bearings was compiled and published in September 1941, in a 12-page "Defense Supplement" to the Timken Engineering Journal.

Recent war developments have given the "Defense Supplement" a new significance. It has proved to be a great convenience to engineers, has contributed largely to increased output, and has helped to speed up delivery. Copies are available upon request.

AMONG EQUIPMENT MEN...

Hunt Tool Co. Announces New High-Pressure Valve

Hunt Tool Co., Houston, Tex., has announced the addition of an all-steel, heavy-duty, high-pressure valve to its series of line valves.

This new series of line valves is of simple design, and features a reversible disk and seat of stainless steel. The seat is held in place by two standard A.P.I. rings, which, being of lower Brinell hardness than the disk, take the wear, assuring positive seal as the seat and disk wear. The same disk and seat will fit any of

the various valves of the same size, whether screwed or flanged.

The valve is manufactured in both the 2-in. and 4-in. range, 4,000 and 6,000-lb test, screwed or flanged. Due to the compact design of this type valve, it eliminates unnecessary connections and reduces space requirements to a minimum.

Construction is such, the manufacturer states, that it is unnecessary to remove the valve from the line to reverse or renew the disk or valve. It is only necessary to remove the eight flange bolts, and raise the bonnet sufficiently to clear the seat. In addition to this feature, the manufacturer says, the valves can be repacked under pressure, as bonnet top has a machined recess which seals the valve around the stem when it is in full, open position.

The new Hunt valves are manufactured according to the A.S.M.E. code. Complete details can be obtained by writing Hunt Tool Co., Houston.

Proper Axle Maintenance Urged by Timken Official

W. F. Rockwell, president of the Timken-Detroit Axle Co., Detroit, Mich., urges truck and trailer owners and operators to check up on their "A.M." (axle maintenance) setup now to assure the most satisfactory and longest possible service from their equipment.

"Regardless of the make or size of trucks and trailers you are using, and regardless of the type of axles under them, proper axle maintenance is one of the vital phases of truck and trailer care," Mr. Rockwell advised owners and operators. "Although sometimes overlooked in otherwise thorough and efficient servicing setups, proper axle maintenance does have a definite bearing on long and satisfactory truck and trailer operation," he asserted.

"In Timken's testing laboratories, which are among the most completely equipped laboratories in the country, we have been testing axles and brakes and the materials that go into them, for a number of years," Mr. Rockwell said. "Among other things, these tests have brought out the vital importance of proper lubrication, regular inspection and servicing, and proper tire inflation on the length of life of the axle. At this time, the relation of proper tire inflation to long axle life is of especial interest, with the current emphasis on the conservation of rubber.

"The growing interest on the part of truck and trailer owners and operators in proper axle maintenance is indicated by the large number of requests coming in for Timken's new booklet, 'How Tires Affect Axles.' The booklet contains news of the laboratory and road tests establishing this relationship, together with practical suggestions on the care of tires for longer axle life," Mr. Rockwell said.

Cummins Engine Appoints Buttles Western Manager

P. E. Letsinger, vice president in charge of sales, Cummins Engine Co., Columbus, Ind., announces the appointment of D. J. Buttles as western manager with offices in the newly established direct-factory branch at Salt Lake City, Utah. The district embraces 11 western states, British Columbia, Alaska and Hawaii.

D. J. BUTTLES

Under Mr. Buttles' management are three sales regions. In each of these is a sales representative. R. H. Wills is in charge of the Northwest region; Tom Collins, the Southwest region, and it is understood that a new man will be selected to cover the third region, with office either at the branch in Salt Lake City or the subbranch in Denver, Colo. No announcement has yet been made of the local manager for Salt Lake City or Denver.

Service in this territory will be handled by Paul Phillips, working out of the Salt Lake branch covering the Northwest, and Clyde Tatman, who for the last 9 years has been associated with the Diesel Motor Sales & Service Co., Los Angeles, will cover the Southwest.

With the Cummins factory now on a 24-hour, 7-day-week schedule, engine production has been stepped up nearly three times. This entire engine volume is going directly to prime defense uses. One of the important projects before the factory branch is the study of unit repair, including the exchange of complete units for service.

Weatherford Company Adds West Coast Distributors

Weatherford Spring Co., Weatherford, Tex., announces that National Supply Co., States Sales & Service, Inc., and Republic Supply Co. have been added to its list of West Coast distributors for Weatherford wall scratchers and casing guides. Adequate stocks of this equipment are now available at any California store of these companies.

George Stevenson Promoted By American Meter Company

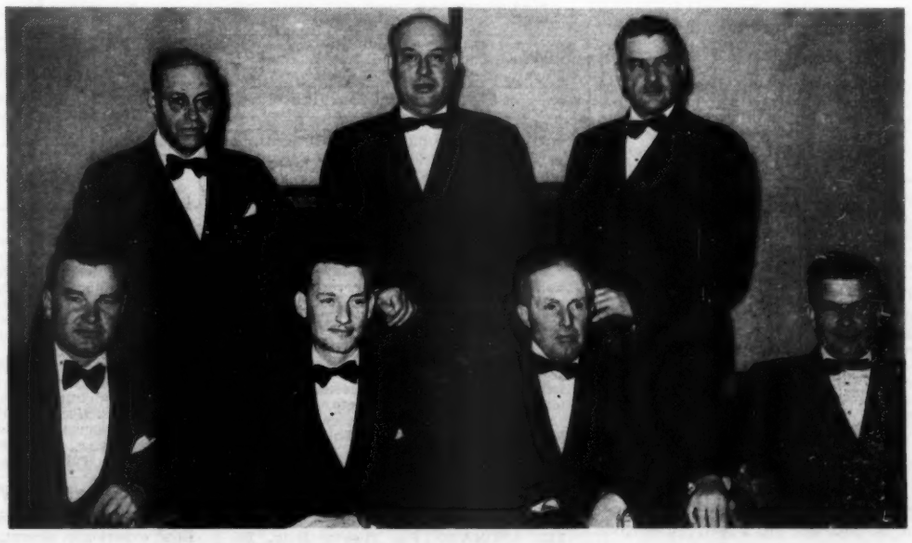
George Stevenson, sales engineer, has been appointed assistant manager of American Meter Co.'s Pacific Coast factory and sales service with headquarters in Los Angeles, Calif. Mr. Stevenson has been associated with the company 14 years.

BUSINESS NOTES

The Frederick Post Co. is pleased to announce the opening of a new factory branch at 1215 Capitol Street, Houston, Tex. This new outlet for Post products brings to the Houston territory a complete line of Post blueprint and kindred sensitized products, drafting and engineering materials.

NEW OFFICERS OF LOS ANGELES NOMADS HONORED AT BALL

Newly elected and retiring officers of the Los Angeles, Calif., chapter of Nomads were specially honored at the chapter's third annual inaugural dinner-ball at Long Beach, Calif., recently. More than 200 members and guests, including several from other countries, attended.



Some of the new or reelected officers are shown in the accompanying picture. Standing, left to right, are: J. C. Ballagh, Patterson-Ballagh Corp., assistant secretary; E. B. Fowks, Emsco Derrick & Equipment Co., national regent and retiring president; D. B. Waite, Pacific Pump Works, assistant treasurer. Seated, left to right, are: Roland E. Smith, Grant Oil Tool Co., sergeant-at-arms; W. F. Bettis, M. O. Johnson Oil Field Service Co., president; E. M. Reese, Oil Well Manufacturing Co., vice president, and E. R. Smith, Lane-Wells Co., treasurer.

Tom C. Murphy, Martin-Decker Corp., assistant sergeant-at-arms; R. J. Eiche, secretary, and T. Sutter, national regent, are other officers.

Among guests at the inaugural were John Domercq, California Standard Arabian Oil Co., recently stationed in Arabia; William Thornberry, Ecuador Oil Fields, Ltd., Ecuador; A. F. Driskill, Jack Devine and William Foran, Iraq Petroleum Co., Iraq; Fred Vandenburg, Colombian Petroleum Co., Colombia; G. C. Higgins, B.P.M., Near East and East Indies, and Claude Banta and Al Farrow, Houston, Tex., Nomads.

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Texas, New Mexico, Oklahoma, Louisiana and Illinois
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Inquiries Invited
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Paul Brown Bldg., St. Louis, Mo.

FOR SALE: Oil and gas leases, small production, drilling propositions, fluorspar and rock asphalt deposits. Reports and maps furnished on request. W. P. Harley, Bowling Green, Ky.

THE
OIL PROPERTIES EXCHANGE
For Sale: Many Producing Oil Properties, Royalties, Drilling Blocks, and Oil Investments of various sizes in Mid-Continent area. Contact us to Buy or Sell properties.
Alexander Bldg., Tulsa, Okla.

CHEAP CRANE COUNTY Sec. 18, B28, under Magnolia-Stanolind leases. Jefferson G. Smith, 215 Littlefield Bldg., Austin, Tex.

145 ACRES between Highway 82 and railroad in 31-19-7 MONTGOMERY COUNTY, MISS. on major company seismograph HIGH. 90 day spudding required but deed you farm if no oil here. On ideal shore line structure, eminent geologists state 4 producing sands up to 3500 ft. OIL, 1369 Court, Memphis, Tenn.

WATCH GEORGIA
For information write C. W. Deming, Registered Dealer, Waycross, Ga.

EAST TEXAS 9,000 ft. Paluxy-Trinity sand wildcat. Quick bet for 10 to 50 for one. E. CROFT, PROCTOR, TEXAS.

CENTRAL NEBRASKA
FOR SALE: Oil and Gas leases—Royalties, on proven structures by core drill—also unproven acreage. Loup Valleys Royalty Co., Loup City, Nebraska.

DRILLING Blocks, for farm out, near McLouth; 40-acre lease close in. Harry Haynes, Grantville, Kansas.

ATTENTION WILDCATTERS: I have over 25,000 acres State-owned land leased in "Great Arch" district Northern Haakon County, South Dakota for responsible driller on reasonable terms. No cash bonus required. JOHN F. SCHOOF, Gettysburg, South Dakota.

For Rent

FOR RENT: Office space and warehouse facilities for oil field specialty company. Location center of Supply Row. Miller Sand Pump Company, Kilgore, Texas.

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BURKHART'S legal blanks and general forms serving Mid-Cont. oil field since 1908—Okla. Kans. N. Mex. Tex. Ala. Ark. Fla. Ga. Ill. Ind. Ky. La. Mich. Miss. Mo. Neb. N. Dak. Tenn. Wyo. Free catalog samples on request. Burkhart Ptg. & Sta. Co., 115 S. Cinn., Tulsa, Oklahoma.

Wanted

WANTED: Proven Oil production deals $100,000 or more, no brokers.
M. R. TRAVIS
1702 S. Boulder, Ph. 2-2447, Tulsa, Okla.

ANY person who has known or heard of GIB MORGAN, a driller originally from Pennsylvania, is invited to communicate with Mody C. Boatright, University of Texas, Austin.

Addresses Wanted

MILES T. McHALE
Anyone knowing the whereabouts of Miles T. McHale, an oil driller, who lived in Houston, Texas, some time ago, please communicate with S. Lipson, 6 Beacon Street, Boston, Mass.

Patent Attorneys

PATENTS — TRADE MARKS
All cases submitted given personal attention.
Form "Evidence of Conception" with instructions for use and "Schedule of Government and Attorney's Fees"—FREE.
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WE BUY & SELL all types of Oil and Gas Royalties. Sales restricted to registered dealers only. Grimes Royalty Co., National Mutual Bldg., Tulsa, Okla.

INQUIRIES invited to buy or sell producing royalties, Illinois preferable. J. A. Wolf, 407 S. Dearborn St., Chicago, Ill.

DEEDED ROYALTIES
State Oil & Gas Leases
Harry S. Wright, Farmington, N. M.
REGISTERED ROYALTY DEALER.

ROYALTY interest under 160 acres on highly geologized structure Elk County Kansas Structure already proven productive. 5 producing horizons. Direct offset up structure from 400 bbl. well. I. E. McNicol, Box 1134, Tulsa, Okla.

OUR READY MARKETS Enable us to pay cash for producing royalty acreage, lots, units and oil payments. GLOBE SECURITIES CO., LTD., Oklahoma City.

Incorporation

DELAWARE CHARTERS: Complete service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.

Geophysical Service

HOMER L. FITCH, GEOPHYSICIST AND OIL LOCATION ENGINEER, Drawer 711, Brownsville, Texas. SAVE money and materials by drilling only locations that will be producers. Capital needed to develop some of our best SHALLOW OIL STRUCTURES.

Mailing Lists

ROYALTY owners, Oil investors, Unit holders, Stockholders, Operating personnel of oil industry. Oil Industry Mailing List Co., Tulsa Loan Bldg., Tulsa, Okla.

Oil Industry Printing

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

Financing

CAPITAL SEEKERS—Interested in raising $25,000 or more for a legitimate project should communicate with AMSTER LEONARD, Fox Theater Bldg., Detroit, Mich.

OUT OF 5000 American financial houses only 223 bought small issues last few years. The 223 names $4.00. JOHN F MORRIS, Box 5411, Philadelphia.

Business Opportunity

MONEY making wholesale Lube Oil and Grease Plant. We cover parts of five states. Owner retiring account of health Established Brands, Registered and Copyrighted. No debts. Terms Cash. % Interest about $35,000. Box A-882, The Oil and Gas Journal, Tulsa, Okla.

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For Oil Refinery work carrying high priority ratings of A-1-A and A-1-B under

Government Defense Program

Working 56 hours 3 weeks per month and 44 hours one week with time and one-half for work in excess of 40 hours per week.

Must have experience in design of:

Oil Refinery Process Piping, Concrete and Structural, Oil Heating Furnaces, Pressure Vessels, Electrical Control and Light and Power Conduit Systems.

Can use several piping squad leaders. Must be thoroughly experienced on piping design and layout.

ARTHUR G. McKEE & COMPANY
Engineers & Contractors
OIL REFINERIES
BLAST FURNACES
STEEL PLANTS
2300 CHESTER AVENUE
CLEVELAND, OHIO

CHEMICAL ENGINEERS

WANTED: Chemical Engineers with plant operating experience — Ammonia Synthesis experience preferred but not required. To locate in Southwest. Write or wire Lion Chemical Corporation, 3427 R.C.A. Building, New York City.

LARGE oil marketing company desires employ two executives; one to have entire charge of purchasing petroleum products and pricing same for resale. Must have refinery connections, freight rate and traffic experience. Other man to have complete charge of Accounting Department, sales and general statistical analysis, and personnel supervision.

Both must be college graduates not over forty years of age, free to travel extensively and must have at least several years of practical experience in general marketing operations. Send pull particulars first letter. Box A-910, The Oil and Gas Journal, Tulsa, Okla.

Situations Wanted

REFINERY SUPERINTENDENT — 18 years' experience, operation, maintenance, design, construction. Age 40, resourceful, careful, energetic. Box A-880, The Oil and Gas Journal, Tulsa, Okla.

EXECUTIVE with twenty-five years' experience in the producing and land departments, part of this time as executive vice president of major Independent company which was merged with a major company, desires connection independent company or parties with money to invest in the oil business as there are many opportunities in the southwest country to make money. Box A-902, The Oil and Gas Journal, Tulsa, Okla.

Situations Wanted

REFINERY Superintendent, desires connections, experienced in the operation, maintenance and construction of modern refining equipment, Cracking, Reforming, Polymerization and Alkylation. Have handled road oils and asphalts. Familiar with Eastern, Mid Cont. and Western Crudes. Box A-890, The Oil and Gas Journal, Tulsa, Okla.

CRACKING Plant Superintendent — 15 years' experience in operation, maintenance, design and construction of cracking plants and units for processing light petroleum fractions. Graduate Chemical Engineer from Texas A & M in 1927. Married. Age 36. With same company 15 years and now employed but desire advance. Box A-900, The Oil and Gas Journal, Tulsa, Okla.

SITUATION WANTED: Married man, well experienced in buying leases and curing titles wants position with reliable company. Address Box 372, Jasper, Tex.

Equipment Wanted

A NUMBER of 55,000 barrel tanks. Give complete dimensions, weights and specifications: also prices as is and if possible dismantled f.o.b. with pieces numbered and diagrammed. Also interested in other sizes. Box A-891, The Oil and Gas Journal, Tulsa, Okla.

TANK CARS
Regardless of condition
Get up on present prices!
This may be the time to liquidate them!
Quotations cheerfully made without obligation
IRON & STEEL PRODUCTS, INC.
13412 S. Brainard Ave., Chicago, Ill.
"ANYTHING containing IRON or STEEL"

For Sale—Equipment

⅞" SUCKER Rods suitable for bolts and reinforcing. Oklahoma City district.
MIKE TRAVIS
1702 S. Boulder Tulsa, Oklahoma.

FOR SALE: Pressure Vessels handling 100 pounds working pressure 8' diameters 31' 8" lengths. Rectangular tanks, capacity 25,000 gallons and 40,000 gallons each. 26 tons I beams one carload, 12-inch I beams 13' 2" long. 36-inch I beams in 22, 36, 38 foot lengths. I beams $61.00 ton, f.o.b. here, approx. 27 tons. Shipments made same day purchased. HARVEY BROS., 706 Rudd, Canon City, Colo.

FOR SALE: 2 pieces 18" x 6 ply x 50' used belting; 1 piece 20" x 6 ply x 50' used belting—good condition. Galoob Iron & Metal Co., Box 372, Healdton, Okla.

FOR SALE: 125 H.P. 200 W.P. Broderick Boiler, Code Condition, $975. Melton Supply Co., Seminole, Okla.

60,000'—12¾" OD PIPE, A-1
Weight is 34.55.
Located in Tulsa County.
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COMPLETE 2000 BBL. TOPPING PLANT, 47 STORAGE TANKS, PERCO TREATING PLANT, CARLOAD ETHYL PLANT, HEAT EXCHANGERS, ALL RETUBEABLE, 5 TRUCK TRANSPORTS

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25 K.W. and 40 K.W. Gas Engines, 220 volts. D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x6 Ingersoll-Rand ER-1 Air Compressor. Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.
Terms to suit.
CINCINNATI MACHINERY & SUPPLY CO.
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FOR SALE: 1 Ft. Worth Spudder, 2500 ft. capacity, and 1 Star Spudder, 4,000 ft. capacity. Both machines now drilling out of Tulsa. O. B. Hausam, 4203 S. Madison, Tulsa. Phone 4-4288.

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3—55,000 Bbl.
1—25,000 Bbl.
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2—10,000 Bbl.
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4— 2,500 Bbl.
3— 1,000 Bbl.
1— 600 Bbl.
1— 100 Bbl.
2— 1,200 Bbl. Agitators.

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Caterpillar, crawler type, size "35" $495; size "65" with nigger head winch $895; Austin Western hydraulic grader 10' blade $650. O. C. Evans, Mt. Sterling, Kentucky.

FOR SALE at Bartlesville: 15 oak drafting tables, $35 each. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE: 6 x 16 Wilson-Snyder Power Slush Pump. Melton Supply Co., Seminole, Okla.

FOR SALE near Wewoka, Oklahoma: 2—80 H.P. Type V Foos Gas Engines complete in good operating condition. Patridge, Cities Service Oil, Bartlesville, Okla.

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FOR SALE: 4188' of 6⅝", 24 and 26# Seamless extreme line casing. Critchett & Woods, Olla, Louisiana.

FOR SALE: One, Type 40, 45 HP single Cooper-Bessemer Unit less Compressor Cylinder, near Madison, Kansas. $250.00. Cities Service Oil Co., Bartlesville, Okla., H. D. Patridge.

FOR SALE at Oklahoma City: 1—100 H.P. Kewanee 200# W.P. oil field type boiler. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE

20,000' 12¾" O.D. lapweld pipe.
5,000' 7", 24 lb. seamless casing.
5,000' 2½" seamless upset tubing.
300 sets 3" tool joints, full hole.
200 sets 3" full hole tool joints.
Both steam and power drilling rig. A complete line of drilling and pumping equipment.

Wire, write, or phone the

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60 day tryout on once run ⅞" alloyed Oklahoma City second hand sucker rods to reliable operators on 10,000 foot lots. Your use of them subject to the approval of my engineer. Rods in A-1 condition. Price about half of new.
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FOR SALE: Pipe & Supply Yard—All Material, Equipment, Buildings, Fence. Galoob Iron & Supply Co. Phone 2-0438, 1300 S. E. 29th St., Oklahoma City, Okla.

FOR SALE: Wilson-Mogul Drawworks with water cooled brakes and 100 H.P. International Motor. Melton Supply Co., Seminole, Oklahoma.

FOR SALE

1240 ft. 7" O.D. 24-lb. Casing.
2911 ft. 2½" U.S. 6½-lb. Seamless Tubing.
2800 ft. ⅞" Sucker Rods.
600 ft. 3" Line Pipe.
1—1000 Bbl. 12-Gauge Steel Bolted Tank.
2—500 Bbl. 12-Gauge Steel Bolted Tanks.
1—250 Bbl. 12-Gauge Steel Bolted Tanks.
1—70 H.P. Donovan Boiler (License for 125 lb. pressure).
1—42 H.P. Model U-10 International Motor.

The motor has been in service for 18 months. The pipe and rods just recently pulled, are in excellent condition and now stacked on location. For prices, phone or wire Ira Blevins or Blevins Welding Co., Texarkana, Arkansas.

POWER RIG COMPLETE

Capable of drilling to 6000'. Now in Kansas. Write 302 Commercial National Bank Building, Phone 3-8601, Shreveport, La.

WE CARRY a full line of Drilling and Fishing Tools, Stems, Bits, Spiders, Slips, everything in the drilling line. Degen Pipe & Supply Co., 401 N. Boston, Tulsa, Okla.

FOR SALE—100,000 feet New Seamless 5½" O.D. ¼" Wall Plain End Gas Line.
L. B. FOSTER COMPANY
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BOILERS
FROM
RODESSA REFINERY, SHREVEPORT, LA.

4—320 HP Babcock & Wilcox Stirling type water tube boilers, Class S No. 16 with oil burners, 304 3¼" OD boiler tubes. Last insurance inspection Jan., 1940 approved for 150 lbs. working pressure. One complete set of new tubes for one boiler.

1—Cochrane feed water heater, Class FB, 2000 BHP.

2—Fairbanks-Morse centrifugal water pumps, 2 stage, driven by Kerr turbines, 25 HP, size 3A, 3,000 RPM.

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Main Office: Kansas City, Mo. LD. Phone 169
Harry B. Strauss, Manager

For Sale—Equipment

FOR SALE at Bartlesville: 1 model 1312 photostat machine. Complete $750. Patridge, Cities Service Oil Co., Bartlesville, Okla.

1—Complete Big Diesel full electric, direct current rig.
1—Medium size Direct current full electric rig.
4—Rebuilt 120 HP Diesel engines.
1—Rebuilt 200 HP Diesel Engine.
1—Small steam rig.
1—Late Model "S" Cardwell Rig complete. Made 7 holes, same as new and equipped with 6,000 feet of 3½" full hole drill pipe which has made three holes.
3—300# W.P. Boilers, A-1 Condition.
Also stock of new engines.

K. S. RICHARDS
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Fort Worth, Texas.

FOR SALE: Complete rotary rig suitable for 3500 ft. drilling. Muskogee Iron Works draw works, powered by 165 H.P. Hercules Motor, 7¾ x 12 Gardner-Denver Pump, powered with R-6-1 Climax engine, 3300 ft. 4½" drill pipe, etc. Price $19,500.00. Terms. Melton Supply Co., Seminole, Okla.

15,000 to 20,000 ft. 20" O.D., 3/16" Wall .35 - .45 Carbon Steel Pipe P. E. in 50 ft. length good for low pressure line. Also Quantity Dresser Couplings, Ells and other Fittings.

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BROWN-STRAUSS CORPORATION
KANSAS CITY, MISSOURI

FOR SALE: 1 Motor driven rotary drilling rig; suitable for 6,000 ft. work. Melton Supply Co., Seminole, Oklahoma.

FOR SALE at Oklahoma City -:- 1—1930 "35" Allis-Chalmers Crawler Tractor, $400.00. Patridge, Cities Service Oil, Bartlesville, Okla.

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Journalisms:

GLENN M. STEARNS, author of "Engineering Fundamentals," Pages 51 and 52, is associate professor of petroleum engineering at the University of Oklahoma, and has been engaged in the practice and teaching of petroleum engineering for the past 6 years, following graduation from the University of Oklahoma in 1936. For 3 years he was with Cities Service in eastern Kansas; Oklahoma City, East Texas, Hobbs, N. M., the Texas Panhandle and western Kansas in the production engineering department. He returned to the University of Oklahoma as assistant professor of petroleum engineering in 1938.

Mr. Stearns was born in 1910 at Wheeler, Tex., and graduated from high school there. He attended O.B.U. at Shawnee, Okla., alternating in going to school and teaching until 1933 when he received his bachelor of arts degree with majors in chemistry and mathematics.

In summers, Mr. Stearns worked on pipeline gangs in Oklahoma City and for the U. S. Government. He completed work for his bachelor of science in petroleum engineering in January 1936.

Mr. Stearns made a study of welding casing and its economic advantages and received an award from the Lincoln Arc Welding Foundation for a paper on that subject. He specialized in pumping problems in western Kansas during the time when physical potentials were being taken. He also studied pump efficiencies in every-day operation and aided in the original investigation of fluid level measurements as a basis for well productivity determinations.

In addition to regular teaching work, Mr. Stearns recently supervised the installation of the equipment for the A.P.I. pump research project and is now directing the gathering of test data.

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VISITORS to the International Petroleum Exposition in 1940 may remember the three affable Japanese whose knowledge of English seemed to be confined largely to asking questions. For important Nipponese oil men, they had a lamentable ignorance of anything connected with petroleum but they were so very anxious to learn. Many photographs of these suave gentlemen were taken and one appeared in the Journal. The photographs for which they so obligingly posed helped greatly in landing two of them in jail recently as prominent fifth columnists and the third, like the celebrated Guido the Gimlet of Ghent, is dashing off rapidly in all directions.

•

CONDENSATE-RECOVERY and gas-recycling operations which Stanolind Oil & Gas Co. is carrying on in the South Jennings field, Louisiana, involve the handling of some of the highest production pressures yet recorded on the Gulf Coast. In its next issue, a Journal staff member will describe the special measures which have been taken to insure effective control of these pressures and make possible efficient recovery of the condensate. A particular feature of the operations is the utilization of gas expansion during pressure reduction stages to provide refrigeration in order that maximum yields might be obtained.

CALENDAR

March

WISCONSIN PETROLEUM ASSOCIATION, annual convention and equipment show, Schroeder Hotel, Milwaukee, Wis., March 18-20.

OKLAHOMA UTILITIES ASSOCIATION, annual convention, Biltmore Hotel, Oklahoma City, Okla., March 23-24.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, spring meeting, Houston, Tex., March 23-25.

AMERICAN PETROLEUM INSTITUTE, Division of Production, Mid-Continent district, Mayo Hotel, Tulsa, March 26-27.

April

AMERICAN PETROLEUM INSTITUTE, eastern district, Division of Production, William Penn Hotel, Pittsburgh, Pa., April 9-10.

MIDWEST POWER CONFERENCE, annual meeting, Palmer House, Chicago, Ill., April 9-10.

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, Cincinnati, Ohio, April 15-17.

NATIONAL PETROLEUM ASSOCIATION, thirty-ninth semiannual meeting, Cleveland, Ohio, April 16-17.

AMERICAN CHEMICAL SOCIETY, 103rd meeting, Memphis, Tenn., April 20-24.

SOUTHWESTERN GAS-MEASUREMENT SHORT COURSE, Norman, Okla., April 21-23.

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, twenty-seventh annual meeting, Cosmopolitan Hotel, Denver, Colo., April 21-24.

PETROLEUM INDUSTRY ELECTRICAL ASSOCIATION, Washington-Youree Hotel, Shreveport, La., April 22-24.

May

AMERICAN GAS ASSOCIATION, thirty-seventh annual natural-gas convention, New Orleans, La., May 4-7.

NATURAL GASOLINE ASSOCIATION OF AMERICA, Mayo Hotel, Tulsa, May 13-15.

NATIONAL ASSOCIATION OF PURCHASING AGENTS (oil-company buyers' group), Waldorf-Astoria Hotel, New York City, May 25-28.

June

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, semiannual meeting, Cleveland, Ohio, June 8-11.

AMERICAN SOCIETY OF TESTING MATERIALS, Chalfonte-Haddon Hall, Atlantic City, N. J., June 22-26.

October

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, fall meeting, Rochester, N. Y., October 12-14.

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